

Taxonomic Revision of the Family Anthomyiidae from Korea

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ABSTRACT

This paper deals with the anthomyiid-flies from Korea. A total of 81 species belonging to 22 genera are represented in Korean fauna as the result, among them the following 9 species are proposed here new to science as: *Anthomyia koreana* sp. nov., *Botanophila seungmoi* sp. nov., *Acklandia koreacola* sp. nov., *Lasiomma monticola* sp. nov., *Egle podulparia* sp. nov., *Delia expansa* sp. nov., *Phorbia soyosana* sp. nov., *P. dissimilis* sp. nov., *P. taeguensis* sp. nov., and 2 genera, *Acklandia* Hennig, 1976, *Egle* Robineau-Desvoidy, 1830, with the below 12 species are newly recorded from Korea as: *Parapegomyia schineri*, *Nupedia debilis*, *Botanophila striolata*, *Egle muscaria*, *E. longipalpis*, *E. parvaeformis*, *E. parva*, *E. korpokkur*, *Paregle vetula*, *Delia tenuiventris*, *D. coronariae*, *Phorbia longipilis*.

Keys are given for all the taxa respectively, some illustrations of various characters for identification are provided. Arranged are host plants and domestic localities for each species.

INTRODUCTION

The family Anthomyiidae are one of the large groups belonging to calyptrate muscoid flies, being represented by about 1100 described species in all zoogeographic regions, mostly from Northern Hemisphere. The adults may be found under various conditions: on flowers, fruits and vegetation in fields or forest, on animal or plant organisms casted in tidal zone.

The larval habits are rather varied. In many cases feeding on the roots or fruits of the host plants and being leaf-miner, some of these are serious economic pests of agricultural crops and coniferous trees. For example, the larvae of onion maggot (*Delia antiqua*) are of great economic importance and cause serious damage by burrow into the bulbs of the onions or garlicks. Seed cone maggot (*Delia platura*) injures sprouting seeds of several vegetable crops, while spinach leafminers (*Pegomya cunicularia* and *P. hyoscyami*) infest leaves of spinach and beets. The larch cone maggot (*Lasiomma laricicola*) may be the most injurious species among the larch-infesting insect pests, according to Yamada et al. (1972) the damage by the species run as high as 50-70% of seeds in each cone in Japan.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Whereas some of larvae are saprophagous in their tropic level, for instances, maggots of *Anthomyia illocata*, *Adia cinerella*, and *Paregle vetula* live in dung and corps of animal or sewage.

Quite a few species belonging to *Leucophora* are associated with andrenid bees, the clepto-parasitic maggots live on pollens or honey stored by the bees.

But, in spite of their economic importance become increasing trends worldwide, their taxonomy as well as ecology are relatively little available yet in this country.

So, the authors intend to revise this group taxonomically, to provide a basic information for the management of anthomyiid-fly pests.

In this paper, all the known species previously are revised critically, and totally 81 species belonging to 22 genera are treated, among them 9 species new to science and 12 species with 2 genera of hitherto unrecorded from Korea are added.

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MATERIALS AND METHODS

Most specimens examined in present investigation were obtained from various domestic localities throughout Korea, which now deposited in the collection of Systematic Entomology Laboratory, Department of Agricultural Biology, Kyungpook Nat. University, Taegu. The available collections of the Division of Entomology, National Science Museum, Seoul, and Department of Entomology, Institute of Agricultural Science, ORD, Suwŏn, were also checked and borrowed.

Field collections were made numerously throughout Korean peninsular proper with her adjacent islands, either in crop fields, forest, mountainous or seashore areas, by using sweeping net methods. And all the collected domestic localities are appeared here after the administrative

geographical names of Republic of Korea, M.R. -Romanization was adopted for notation, but the provinces were abbreviated as following for convinience.

CB : Ch'ungch'ōngbukto	HH : Hwanghaedo
CN : Ch'ungch'ōngnamdo	HN : Hamgyōngnamdo
GB : Kyōngsangbukto	JB : Chōllabukto
GG : Kyōnggido	JJ : Chejudo
GN : Kyōngsangnamdo	JN : Chōllanamdo
GW : Kangwōndo	PB : P'yōnganbukto
HB : Hamgyōngbukto	PN : P'yōngnamdo

Laboratory works for specimens were examined with a stereoscopic microscope (Olympus SZ-set) and an optical microscope (Olympus BH-set, with PM-10a Photographic system). Drawings were made with the aid of camera lucida (Shimazu).

Tools for manipulation and procedures for dissection of the cleared genitalic structures were prepared using double bath- 10% KOH method, and subsequently genitalia were deeped into sodium hypochloritie (NaClO, efficiency: upto 4%) for 3-4 minutes to be decoloring.

All the morphological terms used here are in accordance with general usage for dipterids and some were abbreviated as following for convinience.

A1, A2, A3: 1st, 2nd and 3rd antennal segments respectively	<i>ntpl</i> : Notopleural seta
<i>ori</i> : Frontal seta	<i>mpl</i> : Mesopleural seta
<i>ors</i> : Fronto-orbital seta	<i>stpl</i> : Sternopleural seta
<i>if</i> : Interfrontal seta	<i>prpl</i> : Propleural seta
<i>acr</i> : Acrostical seta	<i>pstg</i> : Prosigmatal seta
<i>dc</i> : Dorsocentral seta	<i>pre</i> : Presutural
<i>ia</i> : Intra-alar seta	<i>post</i> : Postsutural
<i>sa</i> : Supra-alar seta	<i>prse</i> : Prescutellar
<i>pa</i> : Postalar seta	f1, f2, f3; Fore, middle and hind femora respectively
<i>pra</i> : Prealar seta	t1, t2, t3: Fore, middle and hind tibiae respectively
<i>ph</i> : Posthumeral seta	<i>a</i> : Anterior seta
<i>prst</i> : Presutural seta	

The classification system adopted here are followed after Michelsen (1985).

The keys seperating all the taxa known from Korea are given, the host plants previously reported and observed by the author are included after examined and compared with the known records of other countries when available.

All the materials treated here will be deposited in the collection of Systematic Entomology Laboratory, Department of Agricultural Biology, Kyungpook National University.

HISTORICAL REVIEW

Previous work on Korean anthomyiid-flies is very limited except Suwa (1981, 1982, 1983) and Kwon et Suh (1982, a, b, c, d).

The first records of this group from Korea, so far as the authors are aware, were published by Seedl. Stat. Hamg. (1928) where reported *Delia floralis* and *D. antiqua* from Prov. Hamgy-ongbukto being injurious to vegetables. Subsequently, Kye (1929) also reported the ecology and

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

control methods of *Delia floralis* in Prov. Hamgyöngbukto.

Nakayama (1936) illustrated the morphology and ecology with control methods of '*Anthomyia flavopicta*' (= *Delia floralis*) and '*Helemyia* sp. (sic, = *Delia antiqua*)' in Korea.

Kato (1939) recorded Korea in the distributional range of '*Hylemyia antiqua*' (= *Delia antiqua*) and '*Hylemyia floralis*' (= *Delia floralis*), in treating Japanese and Manchurian species.

Yokoo (1939, 1941) reported on the morphology and ecology of '*Hylemyia antiqua*' (= *Delia antiqua*) in Korea.

He (1940) also reported '*Pegomyia hyoscyami*' (= *Pegomya hyoscyami*), '*Hylemyia antiqua*' (= *Delia antiqua*) and '*Hylemyia floralis*' (= *Delia floralis*), to be injurious to the vegetable in Korea.

Kato (1941) recorded '*Pegomyia hyoscyami* var. *betae*' (= *Pegomya hyoscyami*) occurring in Korea.

Hosoya (1943) recorded Korea in the distributional range of '*Hylemyia laricicola*' (= *Lasiomma laricicola*) from northern Korea.

Kato (1950) included Korea in the distributional range of '*Pegomyia hyoscyami*' (= *Pegomya hyoscyami*) along with Japan.

Lee (1958) and Paik (1958) reported on the life history of '*Hylemyia antiqua*' (= *Delia antiqua*) respectively in Korea.

Shiraki (1958) included Korea in the distributional range of '*Pegomyia hyoscyami*' (= *Pegomya hyoscyami*) and '*Hylemyia floralis*' (= *Delia floralis*), in treating Japanese species.

Kim (1961) reported '*Hylemyia platura*' (= *Delia platura*) from 'Mt. Jiri' (=Mt. Chirisan).

Paik et al. (1963) illustrated '*Hylemyia antiqua*' (= *Delia antiqua*) and '*Pegomyia hyoscyami*' (= *Pegomya hyoscyami*) in their textbook, and Lee (1963) also introduced '*Hylemyia floralis*' (= *Delia floralis*), '*Hylemyia platura*' (= *Delia platura*) and '*Hylemyia antiqua*' (= *Delia antiqua*) in his textbook.

Fan (1965) recorded the following 7 species occurring in Korea: *Anthomyia illocata*, '*Hylemyia (Delia) cana*' (= *Delia platura*), *Hydrophoria* (s. str.) *ruralis*, '*Hylemyia (Paregle) cinerella*' (= *Adia cinerella*), '*Pegomyia (Pegopleta) virginea*' (sic, = *Pegopleta virginea*), '*Pegomyia* (s. str.) *hyoscyami*' (= *Pegomya hyoscyami*) and '*Hylemyia (Delia) floralis*' (= *Delia floralis*).

Park (1967) reported *Hydrophoria ruralis* from 'Mt. Hangak' (=Mt. Hwangaksan), 'Mt. Kaya' (=Mt. Kayasan) and 'Mt. Palgong' (=Mt. Palgongsan).

Zool. Soc. Kor. (1968) made a list of Korean anthomyiid flies as: '*Pegomyia hyoscyami*' (= *Pegomya hyoscyami*), '*Anthomyia brassicae*' (sic, nec, = *Delia platura*), '*Hylemyia floralis*' (= *Delia floralis*) and '*Hylemyia antiqua*' (= *Delia antiqua*).

Ko (1969) listed '*Hylemya laricicola*' (= *Lasiomma laricicola*) as a forest insect pest in Korea.

Park (1971) reported *Anthomyia illocata* from central and southern Korea.

Kor. Soc. Pl. Prot. (1972) listed '*Hylemya antiqua*' (= *Delia antiqua*), '*Hylemya floralis*' (= *Delia floralis*) and '*Hylemya laricicola*' (= *Lasiomma laricicola*) in the catalogue of Korean insect pests.

Henning (1974) included Korea in the distributional range of *Delia antiqua* and *D. floralis*.

Suwa (1974) included Korea in the distributional range of *Lasiomma laricicola*, *Delia antiqua* and *D. floralis* in his Japanese monograph.

Kim et al. (1975) reported *Anthomyia illocata* from Kosŏng.

Ito (1977) included Korea in the distributional range of '*Pegomyia hyoscyami*' (= *Pegomya hyoscyami*), along with Japan.

Suwa (1981a) described *Pegohylemyia shirozui* base on the material collected from 'Ryuzinkaku, Mt. Hanna' (=Mt. Hallasan) and he reported 12 species from Korea, of these the

following 3 species were first recorded by him: *Anthomyia* sp., *Delia longithecra* and *Pegomya quadrivittata*. He (1981b) included Korea in the distributional range of *Anthomyia* sp. B and *Pegomya quadrivittata* in treating with indian anthomyiid-flies.

Kwon et Suh (1982, a, b, c, d) reported 21 species, among them 20 species were newly recorded from Korea and 1 species was new to science: *Meliniella sobaeksana*.

Kim (1982) reported *Anthomyia illocata* from 'Is. Jagai' (=Is. Chagado).

Sun et Zhang (1982) included Korea in the distributional range of *Paregle cinerella* and *Delia platura*, in treating Chinese species.

Suwa et Park (1982) added 4 species from Korean fauna as: *Anthomyia* sp., *Emmesomyia oriens*, *Pegomya spiraculata* and *Pegoplata palposa*.

Kim et Chang (1984) reported *Anthomyia illocata* from 'Mt. Sŏrak' (=Mt. Sŏlaksan).

Suwa (1983b) reported 43 species, among them 22 species were newly recorded from Korea and 3 species were new to science: *Chirosia inspinata*, '*Delia takizawai koreana*' (=Treated here as a junior synonym of the nominate subspecies *Delia robustiseta*) and *phorbia odaesana*.

It might be the latest work a anthomyiid-flies from Korea produced by Suwa (1984) who included Korea in the distributional range of '*Delia takizawai*' (= *Delia robustiseta*), along with Japan.

Therefore, prior to the present study a total of 60 species belonging to 20 genera have been known to occur correctly in this country as discussed above.

CHECK LIST OF KOREAN ANTHOMYIIDAE

Genus 1. *Emmesomyia* Malloch, 1917

1. *Emmesomyia socia* (Fallen, 1825)
2. *Emmesomyia grisea* (Robineau-Desvoidy, 1830)
3. *Emmesomyia hasegawai* Suwa, 1979
4. *Emmesomyia oriens* Suwa, 1974

Genus 2. *Pegomya* Robineau-Desvoidy, 1830

5. *Pegomya spiraculata* Suwa, 1974
6. *Pegomya criniventris* Suwa, 1974
7. *Pegomya quadrivittata* (Karl, 1935)
8. *Pegomya flavifrons* (Walker, 1849)
9. *Pegomya rubivora* (Coquillett, 1897)
10. *Pegomya bicolor jynx* (Seguy, 1926)
11. *Pegomya cunicularia* (Rondani, 1866)
12. *Pegomya hyoscyami* (Panzer, 1809)

Genus 3. *Parapegomyia* Griffiths, 1982

13. *Parapegomyia socculata* (Zetterstedt, 1845)
14. *Parapegomyia schineri* (Schnabl, 1910)

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Genus 4. *Mycophaga* Rondani, 1856

15. *Mycophaga testacea* (Gimmerthal, 1834)

Genus 5. *Alliopsis* Schnabl & Dziedzicki, 1911

16. *Alliopsis billbergi* (Zetterstedt, 1838)

Genus 6. *Nupedia* Karl, 1930

17. *Nupedia nigroscutellata* (Stein, 1920)

18. *Nupedia debilis* (Stein, 1916)

Genus 7. *Pegoplata* Schnabl & Dziedzicki, 1911

19. *Pegoplata palposa* (Stein, 1897)

20. *Pegoplata virginea* (Meigen, 1826)

Genus 8. *Meliniella* Suwa, 1974

21. *Meliniella bisinuata* (Tiensuu, 1930)

22. *Meliniella griseifrons* (Seguy, 1923)

23. *Meliniella sobaeksana* Kwon et Suh, 1982

Genus 9. *Craspedochoeta* Macquart, 1850

24. *Craspedochoeta angulata* Tiensuu, 1938

Genus 10. *Anthomyia* Meigen, 1803

25. *Anthomyia illocata* Walker, 1856

26. *Anthomyia koreana* sp. nov.

27. *Anthomyia* sp.

Genus 11. *Fucellia* Robineau-Desvoidy, 1842

28. *Fucellia kamtchatica* Ringdahl, 1830

29. *Fucellia apicalis* Kertész, 1908

30. *Fucellia boninensis* Snyder, 1965

Genus 12. *Botanophila* Lioy, 1864

31. *Botanophila striolata* (Fallen, 1824)

32. *Botanophila lobata* (Collin, 1967) comb. nov.

33. *Botanophila seungmoi* sp. nov.

34. *Botanophila spinisternata* (Suwa, 1974) comb. nov.

35. *Botanophila shirozui* (Suwa, 1981) comb. nov.

36. *Botanophila maculipes* (Zetterstedt, 1845)

37. *Botanophila maculipedella* (Suwa, 1974) comb. nov.

Genus 13. *Acklandia* Hennig, 1976

38. *Acklandia koreacola* sp. nov.

Genus 14. *Lasiomma* Stein, 1916

39. *Lasiomma laricicola* (Karl, 1928)
 40. *Lasiomma oriens* Suwa, 1983
 41. *Lasiomma octoguttatum* (Zetterstedt, 1845)
 42. *Lasiomma strigilatum* (Zetterstedt, 1838)
 43. *Lasiomma japonicum* Suwa, 1971
 44. *Lasiomma divergens* Fan et Zhang, 1982
 45. *Lasiomma monticola* sp. nov.
 46. *Lasiomma meadei* (Kowarz, 1880)

Genus 15. *Chirosia* Rondani, 1856

47. *Chirosia cinerosa* (Zetterstedt, 1845)
 48. *Chirosia betuleti* (Ringdahl, 1935)
 49. *Chirosia inspinata* Suwa, 1983

Genus 16. *Egle* Robineau-Desvoidy, 1830

50. *Egle muscaria* (Fabricius, 1777)
 51. *Egle longipalpis* Malloch, 1924
 52. *Egle parvaeformis* Schnabl, 1911
 53. *Egle parva* Robineau-Desvoidy, 1830
 54. *Egle podulparia* sp. nov.
 55. *Egle korpokkur* Suwa, 1974

Genus 17. *Adia* Robineau-Desvoidy, 1830

56. *Adia cinerella* (Fallen, 1825)

Genus 18. *Paregle* Schnabl, 1911

57. *Paregle vetula* (Zetterstedt, 1838)

Genus 19. *Hydrophoria* Robineau-Desvoidy, 1830

58. *Hydrophoria ruralis* (Meigen, 1826)
 59. *Hydrophoria montana* Suwa, 1970

Genus 20. *Leucophora* Robineau-Desvoidy, 1830

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

- 60. *Leucophora grisella* Hennig, 1967
- 61. *Leucophora sponsa* (Meigen, 1826)
- 62. *Leucophora unistriata* (Zetterstedt, 1838)
- 63. *Leucophora personata* (Collin, 1921)

Genus 21. *Delia* Robineau-Desvoidy, 1830

- 64. *Delia expansa* sp. nov.
- 65. *Delia hystricosternita* Hsue, 1981
- 66. *Delia longithea* Suwa, 1974
- 67. *Delia tenuiventris* (Zetterstedt, 1860)
- 68. *Delia tumidula* Ringdahl, 1949
- 69. *Delia platura* (Meigen, 1826)
- 70. *Delia antiqua* (Meigen, 1826)
- 71. *Delia floralis* (Fallen, 1824)
- 72. *Delia robustiseta* Judin, 1974
- 73. *Delia cyclocerca* Hsue, 1981
- 74. *Delia echinata* (Seguy, 1923)
- 75. *Delia coronariae* (Hendel, 1925)

Genus 22. *Phorbia* Robineau-Desvoidy, 1830

- 76. *Phorbia soyosana* sp. nov.
- 77. *Phorbia odaesana* Suwa, 1983
- 78. *Phorbia longipilis* (Pandelle, 1900)
- 79. *Phorbia dissimilis* sp. nov.
- 80. *Phorbia fascicularis* Tiensuu, 1935
- 81. *Phorbia taeguensis* sp. nov.

Table 1. Time of adult appearance of Korean anthomyiid-flies.

FLIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. <i>Emmesomyia socia</i>					+							
2. <i>Emmesomyia grisea</i>					+							
3. <i>Emmesomyia hasegawai</i>					+				+			
4. <i>Emmesomyia oriens</i>						+						
5. <i>Pegomya spiraculata</i>						+						
6. <i>Pegomya criniventris</i>							+					
7. <i>Pegomya quadrivittata</i>					+	+	+					
8. <i>Pegomya flavifrons</i>						+						
9. <i>Pegomya rubivora</i>					+							
10. <i>Pegomya bicolor jynx</i>			+		+	+			+			
11. <i>Pegomya cunicularia</i>			+	+	+	+			+			
12. <i>Pegomya hyoscyami</i>												
13. <i>Parapegomyia socculata</i>					+	+	+					
14. <i>Parapegomyia schineri</i>							+					
15. <i>Mycophaga testacea</i>					+	+						
16. <i>Alliopsis billbergi</i>			+		+							
17. <i>Nupedia nigroscutellata</i>					+							
18. <i>Nupedia debilis</i>									+			
19. <i>Pegoplata palposa</i>						+	+	+				
20. <i>Pegoplata virginea</i>				+	+	+	+	+				
21. <i>Meliniella bisinuata</i>					+							
22. <i>Meliniella griseifrons</i>					+	+						
23. <i>Meliniella sobaeksana</i>					+							
24. <i>Craspedochoeta angulata</i>					+	+						
25. <i>Anthomyia illocata</i>					+		+	+	+			
26. <i>Anthomyia koreana</i> s.n.			+		+							
27. <i>Anthomyia</i> sp.						+		+				
28. <i>Fucellia kamtchatica</i>						+	+					
29. <i>Fucellia apicalis</i>			+	+	+	+	+		+			
30. <i>Fucellia boninensis</i>			+	+	+	+	+	+	+			
31. <i>Botanophila striolata</i>					+							
32. <i>Botanophila lobata</i>					+							
33. <i>Botanophila seungmoi</i> s.n.									+			
34. <i>Botanophila spinisternata</i>							+					
35. <i>Botanophila shirozui</i>							+					
36. <i>Botanophila maculipes</i>					+	+						
37. <i>Botanophila maculipedella</i>					+							
38. <i>Acklandia koreacola</i> s.n.				+								
39. <i>Lasiomma laricicola</i>												
40. <i>Lasiomma oriens</i>						+						
41. <i>Lasiomma strigilatum</i>			+		+	+						

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

FLIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
42. <i>Lasiomma strigilatum</i>							+					
43. <i>Lasiomma japonicum</i>							+					
44. <i>Lasiomma divergens</i>					+							
45. <i>Lasiomma monticola</i> s.n.					+	+						
46. <i>Lasiomma meadei</i>					+		+					
47. <i>Chirosia cinerosa</i>					+							
48. <i>Chirosia betuleti</i>					+							
49. <i>Chirosia inspinata</i>						+						
50. <i>Egle muscaria</i>			+	+								
51. <i>Egle longipalpis</i>			+		+							
52. <i>Egle parvaeformis</i>			+	+								
53. <i>Egle parva</i>			+	+								
54. <i>Egle podulparia</i> s.n.			+	+								
55. <i>Egle korpokkur</i>			+	+								
56. <i>Adia cinerella</i>			+	+	+	+	+	+		+		
57. <i>Paregle vetula</i>		+	+								+	
58. <i>Hydrophoria ruralis</i>			+	+	+	+	+					
59. <i>Hydrophoria montana</i>					+					+		
60. <i>Leucophora grisella</i>					+							
61. <i>Leucophora sponsa</i>					+							
62. <i>Leucophora unistriata</i>					+							
63. <i>Leucophora personata</i>				+								
64. <i>Delia expansa</i> s.n.							+					
65. <i>Delia hystricosternita</i>					+							
66. <i>Delia longithea</i>					+	+	+					
67. <i>Delia tenuiventris</i>							+					
68. <i>Delia tumidula</i>					+							
69. <i>Delia platura</i>			+	+	+	+	+	+		+		
70. <i>Delia antiqua</i>			+	+	+	+					+	
71. <i>Delia floralis</i>												
72. <i>Delia robustiseta</i>					+							
73. <i>Delia cyclocerca</i>						+						
74. <i>Delia echinata</i>			+	+	+	+	+					
75. <i>Delia coronariae</i>			+		+	+	+					
76. <i>Phorbia soyosana</i> s.n.					+							
77. <i>Phorbia oaesana</i>					+							
78. <i>Phorbia longipilis</i>			+									
79. <i>Phorbia dissimilis</i> s.n.			+									
80. <i>Phorbia fascicularis</i>					+							
81. <i>Phorbia taeguensis</i> s.n.			+									

SYSTEMATICS

Key to genera of Korean Anthomyiidae

1. Costa of wing with spinular setae widely set on ventral surface distad of costal thorns *Fucellia*
 —. Costa of wing without spinular setae on ventral surface 2
2. Surstylus shorter, about as long as or a little longer than cercal plate, which being rather cordate *Chirosia*
 —. Surstylus usually much longer than cercal plate; if shorter, cercal plate not cordate 3
3. Propleura haired *Anthomyia*
 —. Propleura bare 4
4. Vibrissae separated from each other by a distance shorter than cheek-height *Leucophora*
 —. Vibrissae separated from each other by a distance longer than cheek-height 5
5. Palpus blade-like; 5th sternite of male rather cordate 6
 —. Palpus usually elongate slender; 5th sternite of male not cordate 7
6. 5th sternite of male with tufts of short setae at inner basal margin of each process *Pegoplata*
 —. 5th sternite of male without tufts of setae at inner basal margin of each process *Nupedia*
7. Antenna with arista plumose 8
 —. Antenna with arista pubescent 11
8. Frons slightly narrower than one-third head-width in male *Mycophaga*
 —. Frons much narrower than one-third head-width in male 9
9. Lower calyptra slightly protrudent beyond the upper one *Parapegomyia*
 —. Lower calyptra distinctly protrudent beyond the upper one 10
10. Pteropleura with 1 or few setae *Emmesomyia*
 —. Pteropleura entirely bare *Hydrophoria*
11. In male, abdomen strongly swollen on caudal half, club-shaped; 5th sternite with a tuft of short setulae at inner margin of each process; in female, ovipositor compressed on terminal segment *Phorbia*
 —. In male, abdomen usually not strongly swollen on caudal half; 5th sternite without a tuft of short setulae at inner margin of each process; in female, ovipositor not compressed on terminal segment 12
12. 3rd segment of antenna at most a little longer than wide; epistoma projecting forwards beyond tip of profrons *Egle*
 —. 3rd segment of antenna apparently longer than wide; epistoma not projecting forwards beyond tip of profrons 13
13. Preparamere triangular *Botanophila*

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

- . Preparamere not triangular 14
- 14. Surstylus simply slender *Delia*
- . Surstylus more complex 15
- 15. Parafrontalia with *ors* in male 16
- . Parafrontalia without *ors* 19
- 16. Middle tibia with *av* or *v* 17
- . Middle tibia without *av* and *v* 18
- 17. Mesonotum without accessory setulae between the rows of *pre acr*; mesopleura with at most 1-2 accessory setulae near *pstg* *Adia*
- . Mesonotum with many accessory setulae between the rows of *pre acr*; mesopleura with 10-20 accessory setulae near *pstg* *Paregle*
- 18. Distiphallus with a projection at base *Craspedochoeta*
- . Distiphallus without a projection at base *Meliniella*
- 19. Interfrontalia without *if* in male *Pegomya*
- . Interfrontalia with *if* in male 20
- 20. 5th sternite of male with a projection at basal portion of each process *Acklandia*
- . 5th sternite of male without a projection at basal portion of each process 21
- 21. Hind tibia with apical *pv* *Lasiomma*
- . Hind tibia without apical *pv* *Alliopsis*

Genus 1. *Emmesomyia* Malloch, 1917

Emmesomyia Malloch, 1917, Bull. Brookl. Ent. Soc. 12: 113.

Type-species: *Emmesomyia unica* Malloch, 1917

Type-locality: N. America.

Rhodesina Malloch, 1921, Ann. Mag. Nat. Hist. 9(7): 424.

Type-species: *Rhodesina ignobilis* Malloch, 1921

Type-locality: Africa.

Key to species of *Emmesomyia*

- 1. Legs with tarsi yellowish *Emmesomyia socia*
- . Legs with tarsi blackish or dark brownish 2
- 2. Fore tibia without *ad* *Emmesomyia oriens*
- . Fore tibia with *ad* 3
- 3. Secondary *ph* well developed; *pra* a little shorter than posterior *ntpl*
- . Secondary *ph* very weak; *pra* much shorter than posterior *ntpl* *Emmesomyia grisea*
- *Emmesomyia hasegawai*

- 1. *Emmesomyia socia* (Fallen, 1825)

- Musca socia* Fallen, 1825, Mon. Musc. Suec. 9: 82.
Hylemyia villica Meigen, 1838, Syst. Besch. 7: 319.
Anthomyza flavotibiella Zetterstedt, 1845, Dipt. Scand. 4: 1667.
Anthomyia varipes Strobl, 1880, Progr. Ober-Gymn. Seit.: 25, 62.
Anthomyia (Egle) sextana Pandelle, 1900, Rev. Ent. Franc. 19, Musc.: 239.
Emmesomyia villica (nec Meigen): Henning, 1972, Flieg. pal. Reg. 63a: 454-455.
Emmesomyia villica (nec Meigen): Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 3 ^①.

Type-locality: Sweden.

Locality: GB : Mt. P'algongsan, Mt. Sobaeksan ^①.

Distribution: Korea, Japan (Hokkaido, Honshu), U.S.S.R. (South Ural), India, Europe.

Host: Unknown.

2. *Emmesomyia grisea* (Robineau-Desvoidy, 1830)

- Phorbia grisea* Robineau-Desvoidy, 1830, Ess. Myod.: 560.
Chortophila tibialis Macquart, 1835, Suit. Buff. 2: 326.
Emmesomyia socia (nec Malloch): Ringdahl, 1959, Svensk. Ins. 11, Dipt. Musc. 3: 24.
Emmesomyia grisea: Michelsen, 1983, Ent. Scand. 14: 116-117.
Emmesomyia sp.: Suwa, 1983b, Nat. & Lif. 13(2): 42 ^①.

Type-locality: France.

Locality: GW : Mt. Odaesan (=Odae-san ^①).

Distribution: Korea, Japan (Shikoku), China (Manchuria, Taiwan), Europe.

Host: Unknown.

3. *Emmesomyia hasegawai* Suwa, 1979

- Emmesomyia hasegawai* Suwa, 1979, Akitu n.s. 27: 1-6.
Emmesomyia koreana Kwon et Suh, 1982a, Kor. Journ. Pl. Prot. 21: 100-101 ^{①-②}.
Emmesomyia hasegawai: Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 4 (Korea).

Type-locality: Japan.

Locality: GB : Mt. Sobaeksan ^①.

GG : Is. Kangwhado.

GW : Mt. Obongsan ^②.

JN : Is. Wando.

Distribution: Korea, Japan (Hokkaido, Honshu).

Host: The larvae live on cow dung.

4. *Emmesomyia oriens* Suwa, 1974

- Emmesomyia oriens* Suwa, 1974, Ins. Mats. n.s. 4: 187-189.
Emmesomyia oriens: Suwa et Park, 1982, Kontyû 50(3): 502 ^①.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Type-locality: Japan.

Locality: GB : Mt. P'algongsan.

JJ : Mt. Hallasan (=Soungpanak^①).

Distribution: Korea, Japan (Honshu, Kyushu).

Host: Unknown.

Genus 2. *Pegomya* Robineau-Desvoidy, 1830

Pegomya Robineau-Desvoidy, 1830, Ess. Myod.: 598.

Type-species: *Anthomyia hyoscyami* Panzer, 1809

Type-locality: Germany.

Phoraea Robineau-Desvoidy, 1830, Ess. Myod.: 600.

Type-species: *Phoraea flavescens* Robineau-Desvoidy, 1830

Type-locality: Europe.

Chlorina Robineau-Desvoidy, 1830, Ess. Myod.: 602.

Type-species: *Chlorina thoracica* Robineau-Desvoidy, 1830

Type-locality: Europe.

Pegomyia Macquart, 1835, Suit. Buff. Dipt. 2: 350.

Type-species: *Anthomyia hyoscyami* Panzer, 1809

Type-locality: Germany.

Carduophila Hendel, 1935, Zeitschr. Morpl. Ökol. Tier. 4: 333.

Type-species: *Carduophila fodiens* Hendel, 1925

Type-locality: Austria.

Arctopegomyia Ringdahl, 1938, Ent. Tidskr. 59: 195.

Type-species: *Anthomyza tunicata* Zetterstedt, 1846

Type-locality: Sweden.

Chaetopegomyia Ringdahl, 1938, Ent. Tidskr. 59: 196.

Type-species: *Anthomyia setaria* Meigen, 1826

Type-locality: Europe.

Key to species of *Pegomya*

1. Lower calyptra distinctly protrudent beyond the upper one *Pegomya spiraculava*
— Lower calyptra not protrudent beyond the upper one 2
2. *Pra* absent; 5th sternite with numerous long and strong setae on outer margin of each process *Pegomya criniventris*
— *Pra* present; 5th sternite without so many long and strong setae 3
3. Mesonotum with 4 sharp vittae 4
— Mesonotum with 1-3 vittae or hardly vittate 5

4. Parafrontalia separated from each other; fore tibia with strong apical *pd*; hind tibia with 1 distinct *p* *Pegomya quadrivittata*
 —. Parafrontalia convergent each other; fore tibia with fine apical *pd*; hind tibia without *p* *Pegomya flavifrons*
5. Prebasal sclerite of hypopygium with a row of marginal setae *Pegomya rubivora*
 —. Prebasal sclerite of hypopygium without marginal setae 6
6. Fore tibia with 1 distinct *ad*; hind tibia with strong apical *pd* *Pegomya bicolor jynx*
 —. Fore tibia without *ad*; hind tibia with short apical *pd* 7
7. 5th sternite with many short and strong setae at base of each process in male
 *Pegomya cunicularia*
 —. 5th sternite without short and strong setae at base of each process in male
 *Pegomya hyoscyami*

5. *Pegomya spiraculata* Suwa, 1974

Pegomya spiraculata Suwa, 1974, Ins. Mats. n.s. 4: 207-208.

Pegomya spiraculata: Suwa & Park, 1982, Kontyû 50(3): 502 ^①.

Type-locality: Japan.

Locality: JJ : Mt. Hallasan (=Sounghanak ^①).

Distribution: Korea, Japan (Hokkaido).

Host: Unknown.

6. *Pegomya criniventris* Suwa, 1974

Pegomya criniventris Suwa, 1974, Ins. Mats. n.s. 4: 193-195.

Pegomya criniventris: Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 4 ^①.

Type-locality: Japan.

Locality: GW : Mt. Sôlaksan (=Mt. Seolaksan).

Distribution: Korea, Japan (Hokkaido, Honshu), U.S.S.R. (Kuriles).

Host: Unknown.

7. *Pegomya quadrivittata* (Karl, 1935)

Pegomya quadrivittata Karl, 1935, Arb. morph. tax. Ent. Berl. 2: 44.

Pegomya quadrivittata: Hennig, 1973, Flieg. pal. Reg. 63a: 619-621, pl. 67(800), 72(855), 81(945).

Pegomya quadrivittata: Suwa, 1981a, Kontyû 49(1): 107-108 ^①.

Pegomya quadrivittata: Suwa, 1981b, Ins. Mats. n.s. 21: 15-28 (Korea).

Pegomya quadrivittata: Suwa, 1983b, Nat. & Lif. 13(2): 42-43 ^{②-③}.

Type-locality: China (Taiwan).

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Locality: GB : Mt. P'algongsan (=Palgon-san^②, Mt. Palkon^①), Mt. Sobaeksan, Taegu.
GG : Is. Kangwhado, Mt. Myöngsöngsan.
GN : Mt. Kayasan.
GW : Mt. Obongsan, Mt. Odaesan (=Odae-san^③).
JB : Mt. Mayisan.

Distribution: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Taiwan), Burma, Malaya, India, Ceylon.

Host: *Polygonum* spp. and *Rumex* spp.

8. *Pegomya flavifrons* (Walker, 1849)

Eriphia flavifrons Walker, 1849, List dipt. Ins. Brit. Mus. 14: 966.
Anthomyia (*Pegomyia*) *albimargo* Pandelle, 1901, Rev. Ent. Franc. 2, Musc.: 296.
Pegomyia fringilla Malloch, 1920, Trans. Amer. Ent. Soc. 46: 181.
Pegomia (s. str.) *albimargo* (nec Pandelle): Seguy, 1923, Faun. Franc. 6: 157.
Pegomyia celosia Hering, 1932, Zeitschr. pflanz. 42: 570.
Pegomya (s. str.) *flavifrons*: Huchett, 1965, Mem. Ent. Soc. Can. 42: 127-128.
Pegomya albimargo (nec Pandelle): Hennig, 1973, Flieg. pal. Reg. 63a: 517-520, pls. 68 (816, 817), 83(962).
Pegomya albimargo (nec Pandelle): Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 4^①.
Pegomya flavifrons: Suwa, 1983b, Nat. & Lif. 13(2): 42^②.

Type-locality: England.

Locality: GB : Taegu (=Daegu City^①).
GN : Mt. Chirisan (=Jiri-san^②).
JN : Mt. Chogyesan.

Distribution: Korea, Japan (Hokkaido, Honshu), Europe, N. Africa, N. America.

Host: *Celosia* sp., *Cerastinum caspitosum* var. *glandulosum*, *Lychnis* spp., *Melandrium* spp., *Moehringia* sp., *Silene* spp., *Stellaria media*.

9. *Pegomya rubivora* (Coquillett, 1897)

Phorbia rubivora Coquillett, 1897, Can. Ent. 29: 162.
Anthomyia (*Chortophila*) *dentiens* Pandelle, 1900, Rev. Ent. Franc. 19, Musc.: 268.
Chortophila laticornis Stein, 1914, Arch. Nat. 79a(8): 50.
Chortophila (s. str.) *dentiens* (nec Pandelle): Seguy, 1923, Faun. Franc. 6: 124.
Pegomyia rubivora: Hockett, 1924, Mem. Corn. Univ. Agr. Exp. Sta. 77: 47.
Chortophila rubicola Enderlein, 1933, Zeitschr. ang. Ent. 20: 327.
Pegomyia dentiens: Ringdahl, 1959, Svensk. Ins. 11, Musc. 3: 247.
Pegomya rubivora: Hennig, 1973, Flieg. pal. Reg. 63a: 621-624, pls. 66(787), 74(875), 78(916).
Pegomya rubivora: Suwa, 1983b, Nat. & Lif. 13(2): 43^①.

Type-locality: U.S.A. (New York).

Locality: GB : Mt. P'algongsan.

GN : Mt. Chirisan.

GW : Mt. Odaesan (=Odae-san^①).

Distribution: Korea, Japan (Hokkaido, Honshu), U.S.S.R. (Kamchatka), Europe, N.America.

Host: *Rubus* spp.

10. *Pegomya bicolor jynx* (Seguy, 1926)

Pegomyza bicolor jynx Seguy, 1926, Enc. Ent. 3 II, Dipt. 3: 44.

Pegomyia bicolor sapporensis Kato, 1941, Kontyû 15: 63.

Pegomya bicolor jynx: Hennig, 1973, Flieg. pal. Reg. 63a: 535-537, pls. 67(805), 72(850), 83(961).

Pegomya bicolor jynx: Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 4-5^{①-②}.

Pegomya bicolor: Suwa, 1983b, Nat. & Lif. 13(2): 42^③.

Type-locality: China (Kiansu).

Locality: GB : Mt. P'alongsan (=Palgong-san^③), Taegu (=Daegu^①).

GN : Mt. Kûmsan (=Mt. Geumsan^②).

Distribution: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Kiansu).

Host: *Rumex acetosa*, *R. acetosella*.

11. *Pegomya cunicularia* (Rondani, 1866)

Chortophila cunicularia Rondani, 1866, Att. Soc. Ital. Sc. 9: 163.

Pegomyia tristriata Stein, 1908, Mitt. Zool. Mus. Berl. 4: 106.

Pegomya mixta Villeneuve, 1922, Bull. Soc. Ent. Eg.: 52.

Pegomyia hyoscyami (partim): Yokoo, 1940, Ôyô-Dôb. -Zassh. 12: 198 (Korea).

Pegomyia hyoscyami (partim): Ito, 1947, Col. Ill. Ins. Jap. II: 269 (Korea).

Pegomyia hyoscyami (partim): Paik, 1963, Agr. For. Ins. Pests (1970 ed.): 207-208 (Korea).

Pegomyia (s. str.) *hyoscyami* (partim): Fan, 1965, Keys comm. flies Chin.: 45 (North-western Korea).

Pegomyia hyoscyami (partim): Zool. Soc. Kor., 1968, Nom. An. Kor.: 184 (Korea).

Pegomya betae (nec Curtis): Suwa, 1971, Kontyû 39(3): 263.

Pegomya hyoscyami (partim): Hennig, 1973, Flieg. pal. Reg. 63a: 576-588, pls. 64(823), 84(973, 974).

Pegomya mixta (nec Villeneuve): Suwa, 1974, Ins. Mats. n.s. 4: 192.

Pegomya cunicularia: Michelsen, 1980, Ent. Scand. 11: 301-303.

Pegomya hyoscyami (partim): Suwa, 1981a, Kontyû 49(1): 128 (Korea).

Pegomya cunicularis (sic): Kwon et Suh, 1982b, Kor. Journ. Pl. Prot. 21(4): 182-183^{①-③}.

Pegomya cunicularia: Suwa, 1983b, Nat. & Lif. 13(2): 42^{④-⑦}.

Type-locality: Italy.

Locality: CN : Taejôn (=Taejeon^⑤).

GB : Changsa (=Jangsa near Pohan^⑥).

GN : Changsûngp'o (=Jangseungpo^⑦), Ch'ilwŏn Myŏn (=Chilweon Myeon^③), Mt.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Kŭmsan (=Mt. Geumsan^①), Pangŏjin (=Bangeojin^②).

GW : Chumunjin (=Jumunjin^④).

Distribution: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Kiangsu), Europe, N. Africa.

Host: *Chenopodium* spp.

12. *Pegomya hyoscyami* (Panzer, 1809)

Anthomyia hyoscyami Panzer, 1809, Heft. 108: 13.

Chortophila chenopodii Rondani, 1866, Atti Soc. Nat. Mil. 9: 162.

Pegomya hyoscyami var. *silenes* Hering, 1924, Zeitschr., wiss. Ins. biol. 19: 37.

Pegomya hyoscyami var. *meridiana* Hering, 1929, Bull. Agr. Exp. Sta. N. Cauc., nr. 292: 3.

Pegomya hyoscyami (s. l.): Yokoo, 1940, Ōyô-Dôb. -Zassh. 12: 198 (Korea).

Pegomya hyoscyami var. *betae* (s. l.): Kato, 1941, Kontyû 15: 56 (Korea).

Pegomya hyoscyami (s. l.): Ito, 1947, Col. Ill. Ins. Jap. II: 269 (Korea).

Pegomya hyoscyami (s. l.): Kato, 1950, Icon. Ins. Jap.: 1683 (Korea).

Pegomya hyoscyami (s. l.): Shiraki, 1958, San. Ins.: 855 (Korea).

Pegomya hyoscyami (s. l.): Paik, 1963, Agr. For. Ins. Pests (1970 ed.): 207-208 (Korea).

Pegomya (s. str.) *hyoscyami* (s. l.): Fan, 1965, Keys comm. flies Chin.: 45 (Northwestern Korea).

Pegomya hyoscyami (s. l.): Zool. Soc. Kor., 1968, Nom. An. Kor.: 184 (Korea).

Pegomya hyoscyami (s. l.): Hennig, 1973, Flieg. pal. Reg. 63a: 576-588, pls. 64(823), 84 (973, 974).

Pegomya hyoscyami (s. l.): Suwa, 1981a, Kontyû 49(1): 107 (Korea).

Type-locality: Germany.

Locality: The exact collected locality has not given hitherto.

Distribution: Korea(?), Europe.

Host: *Atriplex* spp., *Chenopodium* spp.

Note: There has been known several species-complex in this group, it is doubtful whether the real '*hyoscyami* (sensu stricto)' occurs in Far East Asia or not, the former was proved to be represented in Europe recently.

Genus 3. *Parapegomyia* Griffiths, 1982

Parapegomyia Griffiths, 1982, Flieg. Nearct. Reg. VIII (2): 150.

Type-species: *Anthomyza socculata* Zetterstedt, 1845

Type-locality: Sweden.

Key to species of *Parapegomyia*

1. Hind tibia with 1 or a few *p*; distance between the rows of *pre acr* nearly equal to distance between *dc* and *acr* *Parapegomyia socculata*
- Hind tibia without *p*; distance between the rows of *pre acr* distinctly longer than distance between *dc* and *acr* *Parapegomyia schineri*

13. *Parapegomyia socculata* (Zetterstedt, 1845)

Anthomyza socculata Zetterstedt, 1845, Dipt. Scand. 4: 1683.

Pegomyza consanguinea Tiensuu, 1938, Ann. ent. fenn. 4: 27.

Pegomyza consanguinea (nec Tiensuu): Hennig, 1973, Flieg. pal. Reg. 63a: 506-508, pls. 60(725), 62(744), 63(748).

Eutrichota consanguinea (nec Tiensuu): Suwa, 1974, Ins. Mats. n.s. 4: 237-238.

Eutrichota consanguinea (nec Tiensuu): Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 5⁽¹⁾.

Eutrichota consanguinea (nec Tiensuu): Suwa, 1983b, Nat. & Lif. 13(2): 43⁽²⁾.

Parapegomyia socculata: Michelsen, 1985, Steenstrupia 11(2): 56.

Type-locality: Sweden.

Locality: GN : Mt. Chirisan (=Jiri-san⁽²⁾).

GW : Mt. Obongsan⁽¹⁾.

Distribution: Korea, Japan (Hokkaido), Europe.

Host: Unknown.

14. *Parapegomyia schineri* (Schnabl, 1911)

Pegomyia (*Pegomyza*) *schineri* Schnabl, 1911, Nov. Act., Abh. Leop-Carol. Akad. Nat. 95: 259.

Pegomyia (*Pegomyza*) *puella* Schnabl & Dziedzicki, 1911, Ibid. 95: 259.

Pegomyza socculata (nec Zetterstedt): Ringdahl, 1938, Ent. Tidskr. 59: 174.

Pegomyza socculata (nec Zetterstedt): hennig, 1973, Flieg. pal. Reg. 63a: 512-514, pls. 63 (749), 78(903, 919).

Eutrichota socculata (nec Zetterstedt): Suwa, 1974, Ins. Mats. n.s. 4: 238-240.

Parapegomyia schineri: Michelsen, 1985, Steenstrupia 11(2): 62.

Type-locality: France.

Description

Male: General coloration black, brown greyish pollinose. Head 1.2-1.3 times as high as long in profile; frons a little narrower than anterior ocellus; parafrontalia broadly convergent each other; profrons more or less narrower than A3-width; antenna black, with arista plumose, the longest hair about as long as A3-width, A3 about 2.5-2.9 times as long as wide.

Thorax brown greyish pollinose; mesonotum with broadly blackish marking outside rows of *dc*; scutellum tinged with brown; legs with femur black, tibia yellow, tarsus black.

Wing rather distinctly tinged with yellow, deeper at base; m-m rather distinctly sinuate; calyptra yellow; knob of halter dark brown.

Abdomen white greyish pollinose; median vitta narrow; 5th tergite shining black.

Chaetotaxy: Frons: 3-4 *ori*; mesonotum densely setulose between the rows of *pre acr*; secondary *ph* weak; *pra* longer than anterior *ntpl*; *stpl* 1: 2; *t1*: 1 *ad*, 2 *pv*, strong apical *pd*; *t2*: 1 *ad*, 1 *pd*, 4 *p-pv*; *t3*: 1 *av*, 3 *ad*, 3 *pd*, weak apical *pd*; costal thorns minute.

Genitalia: Cercal plate rather rectangular, with sunken upper margin; surstylus with finger-like process at apex, in lateral aspect nearly rod-shaped; 5th sternite expanded at subbasal portion; preparamere with a process furnished with 2 strong setae on upper and lower posterior margin

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

repectively; postparamere armed with 1 seta on lower posterior margin; epiphallus slender, basiphallus somewhat quadrate, distiphallus rather stout tubular.

Length: Body 5.2-5.5 mm, wing 4.6-5.0 mm.

Female: Abdomen more thinly pollinose than in male, not vittate; frons a little wider than one-third head-width; profrons about as wide as A3-width; t2 without *av*; costal thorns strong.

Length: Body 5.3-5.6 mm, wing 4.6-5.0 mm.

Locality: GW : Mt. Odaesan.

Distribution: Korea (new record), Japan (Hokkaido), Europe.

Host: Unknown.

Genus 4. *Mycophaga* Rondani, 1856

Mycophaga Rondani, 1856, Dipt. Ital. Prod. 1: 102.

Type-species: *Musca fungorum* Degeer, 1776

Type-locality: Sweden.

15. *Mycophaga testacea* (Gimmerthal, 1834)

Coenosia testacea Gimmerthal, 1834, Bull. Soc. Imp. Nat. Mosc. 7: 113.

Mycophaga fungorum: Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop-Carol. Akad. Nat. 95: 114.

Mycophaga testacea: Hennig, 1972, Flieg. pal. Reg. 63a: 447-449.

Mycophaga testacea: Suwa, 1983b, Nat. & Lif. 13(2): 42 ^{①-②}.

Type-locality: Scandinavia.

Locality: GB : Mt. P'algongsan (=Palgong-san ^①).

GN : Mt. Chirisan (=Jiri-san ^②).

GW : Mt. Soyosan.

Distribution: Korea, Japan (Hokkaido, Honshu), Europe.

Host: Unknown.

Genus 5. *Alliopsis* Schnabl & Dziedzicki, 1911

Prosalpia Pokorny, 1893, Wien. Ent. Zeitg. 12: 54 (nom. praeocc.).

Type-species: *Prosalpia styriaca* Pokorny, 1893

Type-locality: Europe.

Alliopsis Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop-Carol. Akad. Nat. 95: 92-93.

Type-species: *Aricia glacialis* Zetterstedt, 1845

Type-locality: Finland.

Paraprosalpia Villeneuve, 1922, Bull. Mus. Hist. Nat. Par. 28: 511.

Type-species: *Prosalpia* (*Paraprosalpia*) *rambolitensis* Villeneuve, 1922

Type-locality: France.

Pseudochirosia Ringdahl, 1928, Ent. Tidskr. 49: 22.

Type-species: *Chirosia fractiseta* Stein, 1908

Type-locality: Sweden.

Eurydactylomyia Ringdahl, 1932, Not. Ent. 12: 16.

Type-species: *Hylemyia (Eurydactylomyia) freyi* Ringdahl, 1932

Type-locality: Finland.

Colpotomyia Ringdahl, 1932, Ent. Tidskr. 54: 31.

Type-species: *Anthomyza laminata* Zetterstedt, 1838

Type-locality: Sweden.

Prosalpiella Ringdahl, 1932, Ent. Tidskr. 54: 31.

Type-species: *Hylemyia benanderi* Ringdahl, 1926

Type-locality: Sweden.

Subprosalpia Ringdahl, 1942, Ent. Tidskr. 63: 140.

Type-species: *Anthomyza denticauda* Zetterstedt, 1838

Type-locality: Finland.

Rhynchoprosalpia Ringdahl, 1942, Ent. Tidskr. 63: 141.

Type-species: *Anthomyza moerens* Zetterstedt, 1838

Type-locality: Finland.

Arctoprosalpia Ringdahl, 1942, Ent. Tidskr. 63: 144.

Type-species: *Chortophila longipennis* Ringdahl, 1918.

Type-locality: Sweden.

Pseudoprosalpia Ringdahl, 1942, Ent. Tidskr. 63: 145.

Type-species: *Anthomyia (Chortophila) atronitens* Strobl, 1893

Type-locality: Alps.

16. *Alliopsis billbergi* (Zetterstedt, 1838)

Anthomyza Billbergi Zetterstedt, 1838, Ins. Lapp.: 678.

Anthomyza aethiops Zetterstedt, 1838, Ibid.: 683.

Aricia lepturoides Zetterstedt, 1845, Dipt. Scand. 4: 1515.

Prosalpia styriaca Pokorny, 1893, Wien. Ent. Zeitg. 12: 56.

Anthomyia (Chortophila) dilaminata Pandelle, 1900, Rev. Ent. Franc. 19, Musc.: 263.

Prosalpia Billbergi: Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop. — Carol. Akad. Nat. 95: 93.

Prosalpia (Prosalpia) Billbergi + *Chortophila dilaminata* (nec Pandelle): Seguy, 1923, Faun. Franc. 6: 79, 125.

Paraprosalpia Billbergi: Ringdahl, 1959, Svensk Ins. II, Musc. 3: 215-216.

Paraprosalpia billbergi: Kwon et Suh, 1982b, Kor. Journ. Pl. Prot. 21(4): 180-181^①.

Paraprosalpia billbergi: Suwa, 1983b, Nat. & Lif. 13(2): 26^②.

Alliopsis billbergi: Michelsen, 1985, Steenstrupia 11(2): 42.

Type-locality: Sweden.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Locality: GB : Taegu (=Daegu^①).

GW : Mt. Odaesan (=Odae-san^②).

Distribution: Korea, Japan (Hokkaido), Europe.

Host: Unknown.

Genus 6. *Nupedia* Karl, 1930

Gymnogaster Lioy, 1864, Atti 1st Ven. 3(9): 989 (nom. praeocc.).

Type-species: *Anthomyia infirma* Meigen, 1826

Type-locality: Europe.

Nudaria Karl, 1928, Tierw. Deutschl. 13: 171 (nom. praeocc.).

Type-species: *Anthomyia infirma* Meigen, 1826

Type-locality: Europe.

Nupedia Karl, 1930, Zool. Anz. 86: 174.

Type-species: *Anthomyia infirma* Meigen, 1826

Type-locality: Europe.

Psiloplastinx Enderlein, 1936, Tierw. Mitt. 16: 199.

Type-species: *Anthomyia infirma* Meigen, 1826

Type-locality: Europe.

Key to species of *Nupedia*

1. Fore tibia with *av* minute and often indiscernible; palpus distinctly broadened at apex . . .
..... *Nupedia nigroscutellata*
— Fore tibia with *av* strong; palpus elongate *Nupedia debilis*

17. *Nupedia nigroscutellata* (Stein, 1920)

Chortophila nigroscutellata Stein, 1920, Archiv. Nat. 84A (9): 90.

Pegomyia slossonae Malloch, 1920, Bull. Brookl. Ent. Soc. 15: 127.

Pegomyia nigroscutellata: Hockett, 1941, Mem. Amer. Ent. Soc. 10: 57.

Nupedia nigroscutellata: Hennig, 1968, Flieg. pal. Reg. 63a: 234-235, pls. 16 (251), 17.
(268).

Nupedia nigroscutellata: Suwa, 1983b, Nat. & Lif. 13(2): 38 ^{①-②} .

Type-locality: N. America.

Locality: GW : Mt. Odaesan (=Odae-san^②), Mt. Sōlaksan (=Seolag-san^①).

Distribution: Korea, Japan (Hokkaido, Honshu), Europe, N. America.

Host: Unknown.

18. *Nupedia debilis* (Stein, 1916)

Chortophila debilis Stein, 1916, Arch. Nat. 81A (10): 183.

Nupedia debilis: Tiensuu, 1938, Ann. Soc. Ent. Fenn. 4: 27.

Type-locality: Germany.

Description

Male: General coloration black, faintly greyish pollinose. Head 1.2-1.3 times as high as long in profile; frons a little wider than half diameter of anterior ocellus: parafrontalia broadly convergent each other; parafacialia and cheek with silvery pruinescence; antenna black, with arista minutely pubescent; palpus and haustellum black, the latter with mentum faintly greyish pollinose.

Thorax thinly purple greyish pollinose; mesonotum bearing rather obscure median vitta; legs wholly black.

Wing hyaline with base more yellowish tinged; m-m nearly straight; calyptra white; knob of halter reddish yellow.

Abdomen dark bluish grey; median vitta broad; fore marginal bands present and often subtriangular.

Chaetotaxy: Frons: 5 *ori*, 1 short *if*; mesonotum: 3 strong *pre acr*; secondary *ph* as long as primary one; *pra* very shorter than anterior *ntpl*; prebasal sclerite setose on posterior margin; t1: 1 strong *ad*, 1 *pv*; t2: 1 *ad*, 1 *pd*, 2 *pv*; t3: 2 robust *ad*, 1 *a*, 1 *av*, 2 *pd*.

Genitalia: Cercal plate subsagittate, with apex slightly concave; surstylus short and somewhat kidney-shaped, armed with some short setulae, in lateral view nearly straight and convex on posterior middle portion; 5th sternite with strong setae along outer margin of each process; preparamere bearing 4 setae on upper and posterior margin; postparamere with apex finger-shaped and pointed forwards, bearing with a few fine setae on posterior margin; epiphallus slender and curved forwards, distiphallus well developed with hardened teeth on posterior margin.

Length: Body 4.9-5.2 mm, wing 4.6-4.9 mm.

Female: Unknown.

Locality: GB : Mt. P'algongsan.

Distribution: Korea (new record), Europe.

Host: *Salix* sp.

Genus 7. *Pegoplata* Schnabl & Dziedzicki, 1911

Pegoplata Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 95: 108-109.

Type-species: *Hydrophoria palposa* Stein, 1897

Type-locality: Germany.

Key to species of *Pegoplata*

1. Lower calyptra protrudent beyond the upper one; fore tibia wholly blackish; secondary ph rather distinct *Pegoplata palposa*
 —. Lower calyptra not protrudent beyond the upper one; fore tibia brownish at base;

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

secondary ph very fine *Pegoplata virginea*

19. *Pegoplata palposa* (Stein, 1897)

Hydrophoria palposa Stein, 1897, Ent. Nachr. 23: 320.

Pegomyia (*Pegoplata*) *palpata* (sic): Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 95: 108-109.

Pegomyia (*Pegoplata*) *palposa*: Seguy, 1923, Faun. Franc. 6: 149.

Hydrophoria orientalis Hockett, 1924, Mem. Corn. Univ. Agr. Exp. Sta. 77: 16.

Pegoplata palposa: Hennig, 1968, Flieg. pal. Reg. 63a: 238-239, pls. 16(225), 17(270), 19(288).

Pegoplata palposa: Suwa et Park, 1982, Kontyû 50(3): 502^①.

Pegoplata palposa: Suwa, 1983b, Nat. & Lif. 13(2): 38^②.

Type-locality: Germany.

Locality: GN : Mt. Chirisan (=Jiri-san^②).

GW : Mt. Odaesan (=Odae-san^①).

Distribution: Korea, Japan (Hokkaido, Honshu, Shikoku), Europe, N. America.

Host: Unknown.

20. *Pegoplata virginea* (Meigen, 1826)

Anthomyia virginea Meigen, 1826, Syst. Besch. 5: 96.

Pegomyia (*Pegoplata*) *virginea*: Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 95: 108-109.

Pegoplata virginea: Ringdahl, 1959, Svensk Ins. II, Musc. 3: 238.

Pegomyia (*Pegoplata*) *virginea*: Fan, 1965, Keys comm. flies Chin.: 44 .

Pegoplata virginea: Suwa, 1981a, Kontyû 49(1): 108^②.

Pegoplata virginea: Suwa, 1983b, Nat. & Lif. 13(2): 40^{③-④}.

Type-locality: Europe.

Locality: GB : Mt. Chuwangsan, Mt. P'algongsan (=Palgong-san^④, Mt. Palkon^②), Taegu.

GN : Mt. Chirisan^① (=Jiri-san^③).

GW : Mt. Obongsan, Mt. Sölaksan.

JB : Mt. Mayisan.

JN : Mt. Chogyesan.

Distribution: Korea, Japan (whole), U.S.S.R. (Ural), Europe.

Host: Unknown.

Genus 8. *Meliniella* Suwa, 1974

Meliniella Suwa, 1974, Ins. Mats. n.s. 4: 37-38.

Type-species: *Meliniella sikisima* Suwa, 1974

Type-locality: Japan.

Key to species of *Meliniella*

1. Notopleuron with a few or some accessory setulae *Meliniella bisinuata*
 —. Notopleuron without accessory setulae 2
2. Hind tibia with strong apical *av*; parafrontalia with fine *ors* in male; larger species, body-length about 7-9 mm *Meliniella griseifrons*
 —. Hind tibia without apical *av*; parafrontalia with distinct *ors* in male; smaller species, body-length less than 5 mm *Meliniella sobaeksana*

21. *Meliniella bisinuata* (Tiensuu, 1930)

Melinia bisinuata Tiensuu, 1930, Ann. Ent. Fenn. 5: 244.
Craspedochoeta bisinuata: Hennig, 1966, Flieg. pal. Reg. 63a: 42, pls. 2(18), 4(56), 5(79).
Meliniella bisinuata: Suwa, 1974, Ins. Mats. n.s. 4: 43-45.
Meliniella bisinuata: Suwa, 1983b, Nat. & Lif. 13(2): 26^①.

Type-locality: Finland.

Locality: GW : Mt. Odaesan (=Odae-san^①).

Distribution: Korea, Japan (Hokkaido), Finland, Sweden.

Host: Unknown.

22. *Meliniella griseifrons* (Seguy, 1923)

Hylemyia griseifrons Seguy, 1923, Ann. Soc. Ent. Franc. 91: 361.
Melinia luteipennis Ringdahl, 1950, Op. Ent. 15: 189.
Craspedocheta luteipennis (sic, nec Ringdahl): Elvberg, 1970, Keys Ins. Eur. U.S.S.R. 5 (2): 465.
Meliniella watanabei Suwa, 1974, Ins. Mats. n.s. 4: 45-46.
Chirosia griseifrons: Hennig, 1976, Flieg. pal. Reg. 63a: 931-933, pl. 111(1187).
Meliniella luteipennis (nec Ringdahl): Suwa, 1979, Ins. Mats. n.s. 10: 3.
Meliniella luteipennis (nec Ringdahl): Kwon et Suh, 1982a, Kor. Journ. Pl. Prot. 21(2): 99-100^①.
Meliniella griseifrons: Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 2 (Korea).
Meliniella griseifrons: Suwa, 1983b, Nat. & Lif. 13(2): 26^{②-④}.

Type-locality: France.

Locality: GG : Is. Kangwhado

GN : Mt. Chirisan (=Jiri-san^④).

GW : Mt. Obongsan^①, Mt. Odaesan (=Odaesan^②), Mt. Sölkasan (=Seolag-san^③).

JB : Mt. Mayisan.

Distribution: Korea, Japan (Hokkaido, Honshu), U.S.S.R. (Maritime Territory), Europe.

Host: Unknown.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

23. *Meliniella sobaeksana* Kwon et Suh, 1982

Meliniella iobaeksana (sic) Kwon et Suh, 1982c, Kor. Journ. Pl. Prot. 21(4): 187-188^①.

Type-locality: Korea.

Locality: GB : Mt. Sobaeksan^①.

Distribution: Korea.

Host: Unknown.

Remark: The specific name '*iobaeksana*' in the original description is a publisher's error and corrected here as above.

Genus 9. *Craspedochoeta* Macquart, 1850

Craspedochoeta Macquart, 1850, Dipt. exot., suppl. 4: 241.

Type-species: *Anthomyia punctipennis* Wiedemann, 1830

Type-locality: N. America.

Craspedochoeta Hockett, 1946, Bull. Brookl. Ent. Soc. 41: 110.

Type-species: *Anthomyia punctipennis* Wiedemann, 1830

Type-locality: N. America.

Melinia Ringdahl, 1929, Ent. Tidskr. 50: 270

Type-species: *Aricia pullula* Zetterstedt 1745

Type-locality: Sweden.

24. *Craspedochoeta angulata* (Tiensuu, 1938)

Melinia angulata Tiensuu, 1938, Ann. Ent. Fenn. 4: 26.

Craspedochoeta angulata: Hennig, 1966, Flieg. pal. Reg. 63a: 41-42, pls. 2(27), 3(44), 5(90).

Craspedochoeta angulata: Suwa, 1983, Nat. & Lif. 13(2): 26^{①-③}.

Type-locality: Finland.

Locality: GN : Mt. Chirisan (=Jiri-san^③).

GW : Mt. Odaesan (=Odae-san^②), Mt. Sōlaksan (=Seolag-san^①).

Distribution: Korea, Japan (Hokkaido), Finland.

Host: Unknown.

Genus 10. *Anthomyia* Meigen, 1803

Anthomyia Meigen, 1803, Mag. Ins. 2: 281.

Type-species: *Musca pluvialis* Linnaeus, 1758

Type-locality: Europe.

Cerochetus Dumeril, 1806, Zool. an.: 282 (nom. praeocc.).

Type-species: *Musca pluvialis* Linnaeus, 1758

Type-locality: Europe.

Anthomya Rafinesque, 1815, An. Nat.: 131.

Type-species: *Musca pluvialis* Linnaeus, 1758

Type-locality: Europe.

Anthomyza Zetterstedt, 1838, Ins. Lapp., col.: 661.

Type-species: *Musca pluvialis* Linnaeus, 1758

Type-locality: Europe.

Ceratochaetus Bezzi, 1907, Wien. Ent. Zeitg. 26: 51.

Type-species: *Musca pluvialis* Linnaeus, 1758

Type-locality: Europe.

Key to species of *Anthomyia*

1. Mesonotum without presutural markings *Anthomyia illocata*
 — Mesonotum with a pair of large presutural markings 2
2. Mesonotum with a band-like postsutural marking *Anthomyia koreana* sp. nov.
 — Mesonotum with a vitta-like postsutural marking *Anthomyia* sp.

25. *Anthomyia illocata* Walker, 1856

Anthomyia illocata Walker, 1856, Proc. Linn. Soc. Lond. 1: 129.

Anthomyia bisetosa Thomson, 1868, Kongl. Sven. Freg. Eug. Res., Dipt.: 555.

Anthomyia vicaricans Schiner, 1868, Res. Nov. Dipt.: 298.

Anthomyia illocata: Fan, 1965, Keys comm. flies Chin.: 38, pl. 1^①.

Anthomyia illocata: Park, 1971, Ill. encycl. faun. flor.: 948, pl. 65(360)^{①-⑦}.

Anthomyia illocata: Kim, 1975, Rep. Kor. Ass. Cons. Nat. 7: 248^⑧.

Anthomyia illocata: Suwa, 1981a, Kontyu 49(1): 102^⑨.

Anthomyia illocata: Kim et Chang, 1982, Gen. Rep. Nat. Cond. 2: 176^⑩.

Anthomyia illocata: Kim et Nam, 1984, Acad. Surv. Rep. Mt. Sorak: 339^⑪.

Type-locality: Borneo.

Locality: GB : Mt. Chuwangsan, Mt. P'algongsan^⑤, Sangju^⑦, Taegu^⑥, Is. Ullungdo^④.

GG : Mt. Tobongsan^②.

GN : Masan.

GW : Kosong^⑧, Mt. Sölkasan^③, (=Mt. Sörak^⑪).

JJ : Is. Chejudo^① (=Cheju-do^⑨).

JN : Is. Chagaedo (=Is. Jagai^⑩), Is. Hongdo, Is. Hüksando.

Distribution: Korea, Japan (Honshu, Kyushu, Ryukyus), China (whole), Philippines, Thailand, Nepal, Ceylon, India, Australia, Micronesia (Is. Bonin, Is. Ocean), Polynesia (Is. Caroline, Is. Christmas, Hawaii).

Host: The larvae are living on the dung and corps of animal or sewage.

26. *Anthomyia koreana* sp. nov.

Description

Male: General coloration black, densely blue greyish pollinose. Head about 1.4 times as high as long in profile; frons slightly narrower than diameter of anterior ocellus; parafrontalia broadly contiguous; interfrontalia dark brown to black; antenna black, with arista shortly pubescent, A3 about 2.1-2.4 times as long as wide; haustellum moderate, with shining mentum.

Thorax blue greyish pollinose; mesonotum bearing a transverse black band which extends posteriorly from transverse suture to second *postsut dc* seta, with a pair of large presutural spots; legs black.

Wing barely yellowish tinged; m-m rather sinuate; calyptra and knob of halter pale yellow.

Abdomen blue greyish pollinose, with markings fused anteriorly on 3rd, 4th, 5th, tergites.

Chaetotaxy: Frons: 3-5 *ori*, 1 vestigial *ors*, 1 fine *if*; mesonotum: 3 *pre acr*; *pra* as long as anterior *ntpl*; mesopleuron with a few accessory setulae near *pstg*; t1: 1 strong *ad*, 1-2 *pv*; t2: 1 *ad*, 1 *pd*, 2 *pv*; t3: 5-7 *ad*, 1 *av*, 3-4 *pd*, 6-8 fine *pv*.

Genitalia: Cercal plate rather cordate, with 4 short strong setae on apex; surstylus stout, with a rectangular knob at apex, in lateral aspect simply slender and curved inwards; 5th sternite extended at apex, with roundly produced middle inner margin and with a finger-like projection on inner basal side of each process; preparamere rectangular, with 2 strong setae; postparamere with a finger-like process at apex, bearing a strong seta on lower posterior margin; basiphallus subquadrate, epiphallus slender, distiphallus much slender, sharply pointed at apex, with a finger-like process subbasally.

Length: Body 4.9-5.9 mm, wing 4.3-5.2 mm.

Female: Unknown.

Type-examined: Holotype male, Mt. Soyosan, GG, C. Korea, 15, V, 1982, coll. Y.J. Kwon; paratypes: 2 males, same data as holotype; 1 male, Taegu, GB, S. Korea, 18, III, 1984, coll. Y.J. Kwon; 2 males, 26, III, 1984, same locality and collector; 3 males, 30, III, 1984, same locality and collector.

Host: Unknown.

Remark: This new species may be separated from the other related species by the male genital characteristics.

27. *Anthomyia* sp.

Anthomyia pluvialis (nec Linnaeus): Suwa, 1974, Ins. Mats. n.s. 4: 48-49.

Anthomyia sp.: Suwa & Park, 1982, Kontyû 50(3): 502^①.

Locality: JJ : Mt. hallasan (=Gwanumsa, Jejudo^①).

Distribution: Korea, Japan (Hokkaido, Honshu).

Host: Unknown.

Remark: The present species has not named by the discoverer, Suwa & Park (1982), yet.

Genus 11. *Fucellia* Robineau-Desvoidy, 1842*Halithea* Haliday, 1837, in Curtis, Guid. Brit. Ins. 2: 279 (nom. praecoc.).Type-species: *Scatomyza fucorum* Fallen, 1819

Type-locality: Sweden.

Fucellia Robineau-Desvoidy, 1842, Ann. Soc. Ent. Franc. 10: 269.Type-species: *Fucellia arenaria* Robineau-Desvoidy, 1842

Type-locality: Europe.

Parachortophila Bigot, 1885, Ann. Soc. Ent. Franc. 6(4): 280.Type-species: *Parachortophila modesta* Bigot, 1885

Type-locality: Europe.

Fucellina Schnabl & Dziedzicki, 1911, Nov. Act., Leop.-Carol. Akad. Nat. 95: 123.Type-species: *Scatomyza griseola* Fallen, 1819

Type-locality: Sweden.

Protofucellia Seguy, 1936, Bull. Soc. Ent. Franc. 41: 281.Type-species: *Protofucellia syuitimorii* Seguy, 1936

Type-locality: Japan.

Key to species of *Fucellia*

1. Legs wholly blackish; prebasal sclerite setose in male; middle tibia a short *pv* in female . . .
 *Fucellia kamtchatica*
 — Legs at least partially yellowish; prebasal sclerite bare in male; middle tibia without *pv*
 in female 2
2. Palpus blackish on apical half; wing with a dark brown apical spot in male
 *Fucellia apicalis*
 — Palpus wholly or largely yellowish; wing without apical spot in both sexes
 *Fucellia boninensis*

28. *Fucellia kamtchatica* Ringdahl, 1930*Fucellia kamtchatica* Ringdahl, 1930, Ark. Zool. 21A: 7.*Protofucellia syuitimorii* Seguy, 1936, Bull. Soc. Ent. Franc. 41: 282.*Fucellia kamtchatica* + *F. syuitimorii* (nec Seguy): Hennig, 1966, Flieg. pal. Reg. 63a: 14,
18, pls. 1(6), 4(65).*Fucellia kamtchatica*: Kwon et Suh, 1981c, Kor. Journ. Plant Prot. 21(4): 186-187 ^{①-④}.*Fucellia kamtchatica*: Suwa, 1983b, Nat. & Lif. 13(2): 24 ^{⑤-⑧}.

Type-locality: U.S.S.R. (Kamchatka).

Locality: GB : Changsa (=Jangsa near Pohan ^⑦), Hup'o, Kamp'o, Kanggu (=Ganggu Myeon ^②), Kuryongp'o, P'ohang, Taebo, Tonghae Myon, Yangnam Myon (=Yangnam Myeon ^①).GN : Changsünp'o (=Jangseungpo ^⑧), Ch'ungmu, Masan.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

GW : Chumunjin (=Jumunjin^⑤), Naksan Beach^④, Sokch'o (=Sogcho^⑥, Sokcho City^③).

JB : Kyökp'o.

JN : Is. Chöpto, Is. Sinjido.

Distribution: Korea, Japan (Hokkaido, Honshu), U.S.S.R. (Kamchatka, Kuriles, Sachalin), N. America.

Host: Living on animal or plant organism casted in the tidal zone, and often infesting marine products.

29. *Fucellia apicalis* Kertész, 1908

Fucellia apicalis Kertész, 1908, Wien. Ent. Zeitg. 27: 71.

Fucellia apicalis: Kwon et Suh, 1982c, Kor. Journ. Plant Prot. 21(4): 185-186^{①-⑤}.

Fucellia apicalis: Suwa, 1983b, Nat & Lif. 13(2): 23^{⑥-⑩}.

Type-locality: China (Swatow).

Locality: CN : Mallip'o (=Manlipo^⑩).

GB : Changsa (=Jangsa near Pohan^⑪), Hup'o, Kamp'o, Kanggu Myön (=Ganggu Myeon^③), Kuryongp'o, P'ohang, Taebo, Tonghae Myön, Yangnam Myön (=Yangnam Myeon^②).

GG : Inch'ön (=Songdo^⑨).

GN : Changsöngp'o (=Jangseungpo^⑫), Ch'ungmu, Masan, Pangöjin (=Bangeojin^①).

GW : Chumunjin (=Jumunjin^⑦), Kyöngp'odae (Gyeongpodae^⑧), Naksan Beach^⑤, Sokch'o (=Sogcho^⑥, Sokcho City^④).

JB : Kyökp'o.

JJ : Sögwip'o (=Sogippo^⑬), Söngsanp'o.

JN : Is. Chöpto, Is. Sinjido.

Distribution: Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu), China (Chekiang, Fukien, Kiangsu, Kwangtung, Shantung), U.S.S.R. (Kuriles), Micronesia (Is. Bonin).

Host: Living on animal or plant organism casted in the tidal zone, and often infesting marine products.

30. *Fucellia boninensis* Snyder, 1965

Fucellia boninensis Snyder, 1965, Ins. Mier. 13(6): 204-205.

Fucellia hypopygialis (nec Ringdahl): Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 1-2^{①-②}.

Fucellia boninensis: Suwa, 1983b, Nat. & Lif. 13(2): 23-24^{③-⑨}.

Type-locality: Is. Bonin.

Locality: CN : Mallip'o (=Manlipo^⑦).

GB : Changsa (=Jangsa near Pohan^⑧), Hup'o, Kamp'o, Kanggu, Kuryongp'o, P'ohang, Taebo, Tonghae Myön, Yangnam Myön.

- GG : Inch'ŏn (=Songdo[®]).
 GN : Mt. Chirisan (=Jiri-san^⑨), Ch'ungmu, Masan.
 GW : Chumunjin (=Jumunjin^④), Kyŏngp'odae (=Gyeongpodae^⑤), Naksan Beach^①, Sokch'o (=Sogcho^③, Sokcho City^②).
 JB : Kyŏkp'o.
 JN : Is. Chŏpto, Is. Sinjido.

Distribution: Korea, Japan (Honshu, Amakusa), China (Taiwan), Micronesia (Is. Bonin).

Host: Living on animal or plant organism casted in the tidal zone, sometimes infesting marine products.

Genus 12. *Botanophila* Lioy, 1864

Egeria Robineau-Desvoidy, 1830, Ess. Myod.: 555 (nom. praeocc.).

Type-species: *Egeria silvatica* Robineau-Desvoidy, 1830

Type-locality: France.

Botanophila Lioy, 1864, Atti Ist. Ven. 9(3): 990.

Type-species: *Anthomyia varicolor* Meigen, 1826

Type-locality: Germany.

Pegohylemyia Schnabl, 1911, Deutsch. Ent. Zeitschr.: 75.

Type-species: *Musca cinerea* Fallen, 1824

Type-locality: Sweden.

Euryparia Ringdahl, 1919, Ent. Tidskr. 50: 269.

Type-species: *Anthomyia varicolor* Meigen, 1826

Type-locality: Germany.

Thrixina Karl, 1928, Tierw. Deutsch. 13, Dipt. III Musc.: 165.

Type-species: *Anthomyia fugax*, Meigen, 1826

Type-locality: Europe.

Buccaria Karl, 1932, Zool. Anz. 98: 304.

Type-species: *Buccaria monticola* Karl, 1932

Type-locality: Poland.

Xanthocnemia Karl, 1943, Stett. Ent. Zeitg. 104: 65.

Type-species: *Hylemyia pseudomaculipes* Strobl, 1893

Type-locality: Alps.

Atrichomyia Karl, 1943, Stett. Ent. Zeitg. 104: 66.

Type-species: *Chortophila (Nudaria) lineatula* Karl, 1928

Type-locality: Germany.

Key to species of *Botanophila*

1. Prebasal sclerite of hypopygium with a row of distinct setae on hind margin
 *Botanophila striolata*

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

- Prebasal sclerite of hypopygium without setae on hind margin 2
- 2. Bristle of *pra* shorter than anterior *ntpl* 3
 - Bristle of *pra* as long as or longer than anterior *ntpl* 4
- 3. Frons with 1 fine *ors* in male; Cheek with a row of genal setae *Botanophila lobata*
 - Frons without *ors*; cheek with 2 rows of genal setae *Botanophila seungmoi* sp. nov.
- 4. 5th sternite with a series of strong setae on each process, the setae becoming longer towards apex of the process in male *Botanophila spinisternata* comb. nov.
 - 5th sternite otherwise in setal pattern 5
- 5. 5th sternite without strong setae on basal portion of each process, but with setae on inner middle portion *Botanophila shirozui* comb. nov.
 - 5th sternite with some strong setae on basal portion of each process 6
- 6. Hind tibia with apical *pd* strong, at least about as long as apical *ad*
 - *Botanophila maculipes*
 - Hind tibia with apical *pd* weak, much shorter and weaker than apical *ad*
 - *Botanophila maculipedella* comb. nov.

31. *Botanophila striolata* (Fallen, 1824)

- Musca-striolata* Fallen, 1824, Mon. Musc. suec. 7: 71.
Anthomyia discreta Meigen, 1826, Syst. Besch. 5: 174.
Aricia trapezoides + *A. arrogans* Zetterstedt, 1845, Dipt. Scand. 4: 1554, 1567.
Aricia auctineryis + *A. sulcella* Zetterstedt, 1860, Dipt. Scand. 14: 6240, 6259.
Anthomyia (*Chortophila*) *insperata* Pandelle, 1900, Rev. Ent. Franc. 19, Musc.: 260.
Pegomyia (*Anthomyia*) *discreta* var. *fugitiva* Schnabl, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 95: 268.
Pegomyia (*Anthomyia*) *discreta* var. *arctica* Schnabl, 1915, Mem. Acad. Sci. Russ., math.-nat., 28(7): 20.
Chortophila bompadrei Berri, 1918, Mem. Soc. Ital. Sic. Nat. Mil. 9: 113.
Chortophila discreta (nec Meigen): Seguy, 1923, Faun. Franc. 6: 125.
Chortophila villeneuvei Seguy, 1923, Ibid. 6: 135.
Hylemyia quadriseta Ringdahl, 1926, Ent. Tidskr. 47: 115.
Hylemyia discreta var. *angustifrons* Ringdahl, 1930, Ark. Zool. 21A (20): 11.
Pegohylemyia discreta (nec Meigen) + *Heterostylus sulcella* (nec Zetterstedt): Ringdahl, 1959, Svensk. Ins. II, Musc. 3: 263.
Pegohylemyia striolata: Hennig, 1970, Flieg. pal. Reg. 63a: 417-420, pls. 35(460, 461), 44 (553), 48(609).
Botanophila striolata: Michelsen, 1983, Ent. Scand. 14: 118.

Description

Male: General coloration black with greyish pollinose. Head about 1.3 times as high as long in profile; frons as wide as distance between posterior ocelli exclusive; parafacialia and cheek bluish grey pruinose; antenna black, with arista minutely pubescent, A3 1.6 times as long as wide; epistoma slightly protrudent forwards beyond tip of profrons.

Thorax faintly greyish pollinose; mesonotum with distinct brownish median, sublateral and lateral vittae; scutellum with large brownish shadow on dorsum.

Wing dark brownish tinged; m-m nearly straight; calyptra yellowish tinged; knob of halter brownish.

Abdomen with broad median vitta and broad fore marginal bands on each tergite; anal sclerite shining black.

Chaetotaxy: Frons: 7 *ori*, 2 *if*; mesonotum 3 fine *pre acr*, a few accessory setulae between the rows; *pra* longer than anterior *ntpl*; prebasal sclerite setose on hind margin; t1: 1 *ad*, 1 *pv*; t2: 1 *ad*, 2 *pd*, 2 *pv*; t3: 4 *ad*, 3 *av*, 2 *pd*, 2 *pv*.

Genitalia: Cercal plate subpentagonal; surstylus simply slender, in lateral view nearly straight; 5th sternite armed with some strong setae on each outer portion, densely setulose on inner margin of each process; preparamere triangular with 2 strong setae; postparamere stout with 1 long seta; epiphallus slender, distiphallus triangular.

Length: Body 4.9 mm, wing 4.3 mm.

Female: Unknown to me.

Locality: GB : Mt. Sobaeksan.

Distribution: Korea (new record), Japan (Hokkaido, Honshu), U.S.S.R. (Kamchatka), Nepal, Europe.

Host: Unknown.

32. *Botanophila lobata* (Collin, 1967) comb. nov.

Pegohylemyia lobata Collin, 1967, Ent. Mo. Mag. 102: 188.

Pegohylemyia lobata: Suwa, 1983b, Nat. & Lif. 13(2): 32-32 ^①.

Type-locality: England.

Locality: GB : Mt. Sobaeksan.

GW : Mt. Sólaksan (=Seolag-san ^①).

Distribution: Korea, England.

Host: Unknown.

33. *Botanophila seungmoi* sp. nov.

Description

Male: General coloration black with brown greyish pollinose. Head 1.2-1.3 times as high as long in profile; frons about equal to distance between posterior ocelli inclusive; parafrontalia widely separated; parafacialia and cheek dark reddish brown; antenna black, with arista shortly pubescent, A3 1.6 times as long as wide; palpus and haustellum black, slender, mentum thinly pollinose; epistoma slightly projecting forwards beyond tip of profrons.

Thorax dull brownish pollinose; mesonotum with obscure brownish median and sublateral vittae; legs wholly black.

Wing brownish tinged and denser basally; m-m nearly straight; calyptra and knob of halter brown.

Abdomen blue greyish pollinose, which is more or less tinged with brown; median vitta narrow and dark brown.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Chaetotaxy: Frons: 5 and a few of accessory *ori*, 1 fine *if*; mesonotum: 3 weak *pre acr*, a few accessory setulae on between the rows; *pra* rather shorter than anterior *ntpl*; secondary *ph* barely distinguished from accessory setulae; *stpl* 1: 2, the posterior lower one shorter than the others; prebasal sclerite not setose; t1: 1 strong *ad*, 1 *pv*; t2: 1 *ad*, 2 *pd*, 1-2 *pv*; t3: 3-4 *ad*, 2 *av*, 3 *pd*, no apical *pv*.

Genitalia: Cercal plate trifurcate at apex, of which middle process rather shorter than the others; sustylus simply slender, narrowly sunken at inner basal margin; 5th sternite armed with some strong setae on outer margin; preparamere subtriangular, with 2 robust setae; postparamere finger shaped at apex, with 1 strong seta; basiphallus rectangular, epiphallus slender, distiphallus membranous.

Length: Body 7.5-7.6 mm, wing 6.5-6.7 mm.

Female: Frons a little narrower than half width of head, with 3 *ori*, 2 *ors* and 1 *if*; abdomen without median vitta.

Length: Body 7.4 mm, wing 6.5 mm.

Type-examined: Holotype male, Mt. Sölaksan, GW, C. Korea, 15, IX, 1984, coll. Y.J. Kwon; paratypes: 3 males and 1 female, the same data as holotype.

Host: Unknown.

Remark: This new species may be separated from the other related species by the male genitalic characteristics.

34. *Botanophila spinisternata* (Suwa, 1974) comb. nov.

Pegohylemyia spinisternata Suwa, 1974, Ins. Mats. n.s. 4: 131-134.

Pegohylemyia spinisternata: Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 3^①.

Type-locality: Japan.

Locality: GW : Mt. Sölaksan (=Mt. Seolaksan^①).

Distribution: Korea, Japan (Hokkaido, Honshu).

Host: Unknown.

35. *Botanophila shirozui* (Suwa, 1981) comb. nov.

Pegohylemyia shirozui Suwa, 1981a, Kontyû 49(1): 104-107^①.

Type-locality: Korea.

Locality: JJ : Mt. Hallasan (=Ryuzinkaku, Mt. Hanna^①).

Distribution: Korea.

Host: Unknown.

36. *Botanophila maculipes* (Zetterstedt, 1845)

Anthomyza maculipes Zetterstedt, 1845, Dipt. Scand. 4: 1708.

- Hylemyia pseudomaculipes* Strobl, 1893, Verh. Zool. bot. Ges. Wien. 43: 249.
Hylemyia (*Pegohylemyia*) *pseudomaculipes* (nec Strobl): Ringdahl, 1933, Ent. Tidskr. 54: 27.
Hylemyia (*Xanthocnemis*) *pseudomaculipes* (nec Strobl): Karl, 1943, Sett. Ent. Ztg. 104: 66.
Xanthocnemis pseudomaculipes (nec Strobl): Ringdahl, 1959, Svensk Ins. II, Dipt. Musc. 3: 257.
Pegohylemyia pseudomaculipes (nec Strobl): Hennig, 1970, Flieg. pal. Reg. 63a: 399-400, pls. 31(501), 47(602), 50(625).
Pegohylemyia pseudomaculipes (nec Strobl): Suwa, 1983b, Nat. & Lif. 13(2): 32^{①-②}.
Botanophila maculipes: Michelsen, 1985, Steenstrupia 11(2): 51.

Type-locality: Sweden.

Locality: GN : Mt. Chirisan (=Jiri-san^②).

GW : Mt. Odaesan (=Odae-san^①), Mt. Sölaksan.

Distribution: Korea, Japan (Hokkaido, Honshu, Shikoku), Europe.

Host: Unknown.

37. *Botanophila maculipedella* (Suwa, 1974) comb. nov.

Pegohylemyia maculipedella Suwa, 1974, Ins. Mats. n.s. 4: 138-140.

Pegohylemyia maculipedella: Suwa, 1983b, Nat. & Lif. 13(2): 32^①.

Type-locality: Japan.

Locality: GW : Mt. Odaesan (=Odae-san^①).

Distribution: Korea, Japan (Hokkaido, Honshu).

Host: Unknown.

Genus 13. *Acklandia* Hennig, 1976

Acklandia Hennig, 1976, Flieg. pal. Reg. 63a: 950-951.

Type-species; *Hylemyia servadeii* Seguy, 1933

Type-locality: Italy.

38. *Acklandia koreacola* sp. nov.

Description

Male: General coloration black with brown greish pollinose. Head 1.3-1.4 times as high as long in profile; frons about as wide as distance between posterior ocelli exclusive; parafacialia and cheek silvery greyish pruinose; profrons much narrower than A3-width; antenna dark brown, with arista minutely pubescent, A3 1.2-1.3 times as long as wide; palpus black; haustellum rather stout, with mentum faintly greyish pollinose.

Thorax brown greyish pollinose; mesonotum with obscure median and sublateral vittae; legs black and thinly greyish pollinose.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Wing pale brownish tinged; m-m slightly sinuate, calyptra whitish, knob of halter reddish yellow.

Chaetotaxy: Frons: 7 *ori*, 1 short *if*; mesonotum; 3 *pre acr*, lacking accessory setulae between the rows; secondary *ph* about 0.6-0.7 times as long as primary one; *pra* rather longer than anterior *ntpl*; mesopleuron: 1 anterior *mpl*, 2 *pstg*; *stpl* 1: 2; t1: 1 *ad*, 1 *p*; f2: 4 strong *pv*; t2: 1 *pd*, 5 *p-pv*, short apical *pv*; f3: a row of *av* and *pv* respectively; t3: 3 *ad*, 3 *av*, 3 *pd*, 2-3 short *pv*.

Genitalia: Cercal plate trifurcated, of which middle process with a knob; surstylus nearly straight, sunken at apex which armed with a conical process; 5th sternite with a finger shaped projection at basal portion of each process; preparamere rectangular, with 3 setae on posterior margin; postparamere well developed, with 1 seta on lower posterior margin; epiphallus degenerated, distiphallus very slender with sharply bifurcated apex.

Length: Body 4.3 mm, wing 4.0 mm.

Female: Unknown.

Type-examined: Holotype male, Taegu, GB, S. Korea, 6, IV, 1982, coll. Y.J. Kwon.

Host: Unknown.

Remark: This new species may be distinguished from the other related species by the male genitalic characteristics.

Genus 14. *Lasiomma* Stein, 1916

Lasiomma Stein, 1916, Arch. Nat. 81A (10): 168.

Type-species: *Lasiops ctenocnema* Kowarz, 1880

Type-locality: Sweden.

Monotrixa Karl, 1943, Stett. Ent. Zeitg. 104: 66.

Type-species: *Aricia octoguttata* Zetterstedt, 1885

Type-locality: Sweden.

Key to species of *Lasiomma*

1. Interfrontalia without *if* in male, when present very fine and vestigial 2
 - Interfrontalia with *if* and rather distinct 3
2. Bristle of *pra* a little shorter than anterior *ntpl*; 3rd antennal segment about 1.5 times as long as wide *Lasiomma laricicola*
 - Bristle of *pra* as long as anterior *ntpl*; 3rd antennal segment about twice as long as wide *Lasiomma oriens*
3. Hind tibia with numerous short secondary *pv* 4
 - Hind tibia without secondary *pv* 6
4. 3rd sternite less than 1.5 times as long as wide in male; hind tibia without *av* *Lasiomma octoguttatum*
 - 3rd sternite more than 1.5 times as long as wide in male; hind tibia with *av* 5

5. Eye distinctly haired *Lasiomma strigilatum*
 —. Eye bare *Lasiomma japonicum*
6. Secondary *ph* as long as primary one; distiphallus slender, with sharply pointed apex in profile *Lasiomma divergens*
 —. Secondary *ph* shorter than primary one; distiphallus trifurcated at apex in profile . . 7
7. Surstylus sinuate on middle portion in profile *Lasiomma monticola* sp. nov.
 —. Surstylus not sinuate in profile *Lasiomma meadei*

39. *Lasiomma laricicola* (Karl, 1928)

Chortophila (*Thrixina*) *laricicola* Karl, 1928, Tierw. Deutschl. 13: 69.
Lasiomma laricicola: Ackland, 1965, Ent. Mo. Mag. 100: 139.
Hylemia laricicola ? (sic): Hosoya, 1943, Nipp. Ring. 25: 184 (Northern Korea).
Hylemyia laricicola: Ko, 1969, Kor. Res. Inst.: 324 (Korea).
Hylemyia laricicola: Kor. Soc. Pl. Prot. List plant dis., Ins. pests, weeds Kor.: 218 (Korea).
Lasiomma laricicola: Suwa, 1974, Ins. Mats. n.s. 4: 84 (Korea).
Lasiomma laricicola: Suwa, 1981a, Kontyu 49(1): 103-104 (Korea).

Type-locality: Austria.

Distribution: Korea, Japan (Hokkaido), U.S.S.R. (Siberia), Europe.

Host: *Larix kaempferi*, *Larix koreana*.

40. *Lasiomma oriens* Suwa, 1983

Lasiomma oriens Suwa, 1983a, Akitu 52: 709.
Lasiomma oriens: Suwa, 1983b, Nat. & Lif. 13(2): 26-29^①.

Type-locality: Japan.

Locality: GN : Mt. Chirisan (=Jiri-san^①).

Distribution: Korea, Japan (Hokkaido).

Host: Unknown.

41. *Lasiomma octoguttatum* (Zetterstedt, 1845)

Aricia octoguttata Zetterstedt, 1845, Dipt. Scand. 4: 1570.
Aricia moesta Holmgren, 1872, Ofv. K. Vet. Akad. Forh. 29: 102.
Chortophila octoguttata: Seguy, 1923, Faun. Franc. 6: 132.
Hylemyia spizellae Hockett, 1924, Corn. Univ. Agr. Expt. Sta. Mem. 77: 33.
Opsolasia octoguttata: Ringdahl, 1959, Svensk Ins. II. Musc. 3: 273.
Lasiomma octoguttatum: Hennig, 1968, Flieg. pal. Reg. 63a; 193-195, pls. 11(176), 15 (228).
Lasiomma octoguttatum: Kwon et Suh, 1982b, Kor. Journ. Plant Prot. 21(4): 181-182^①.
Lasiomma octoguttatum: Suwa, 1983b, Nat. & Lif. 13(2): 31^{②-④}.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Type-locality: Sweden.

Locality: CN : Mt. Töksungsan.

GB : Mt. P'algongsan, Taegu.

GN : Mt. Chirisan (=Jiri-san^④).

GW : Mt. Obongsan^①, Mt. Odaesan (=Odae-san^③), Mt. Söiaksan (=Seolag-san^②).

Distribution: Korea, Japan (Hokkaido, Honshu), China (Chekiang, Hopeh, Hupeh, Inner Mongolia, Manchuria), U.S.S.R. (Kuriles), Europe, N. America.

Host: *Troglodytes troglodytes* in Europe.

42. *Lasiomma strigilatum* (Zetterstedt, 1838)

Anthomyza strigilata, Zetterstedt, 1838, Ins. Lapp.: 684.

Aricia nitidicauda Zetterstedt, 1855, Dipt. Scand. 12: 4730.

Aricia eriophthalma Zetterstedt, 1860, Ibid. 14: 6236.

Lasiops roederi + *L. ctenocnema* Kowarz, 1880, Mitth. Munchn. Ent. Ver. 4: 128, 130.

Lasiomma nitidicauda (nec Zetterstedt): Hennig, 1968, Flieg. pal. Reg. 63a: 191-193, pls. 11(180), 13(199), 14(225).

Lasiomma nitidicauda (nec Zetterstedt): Suwa, 1983b, Nat. & Lif. 13(2): 30^{①-②}.

Lasiomma strigilatum: Michelsen, 1985, Steenstrupia 11(2): 56-57.

Type-locality: Sweden.

Locality: GN : Mt. Chirisan (=Jiri-san^②).

GW : Mt. Odaesan (=Odae-san^①).

Distribution: Korea, China, Nepal, Europe.

Host: Unknown.

43. *Lasiomma japonicum* Suwa, 1971

Lasiomma japonicum Suwa, 1971, Kontyû 39(1): 36.

Lasiomma japonicum: Kwon et suh, 1982d, Kor. Journ. Ent. 12(2): 3^①.

Type-locality: Japan (Hokkaido).

Locality: GW : Mt. Sölaksan (=Mt. Seolaksan^①).

Distribution: Korea, Japan (Hokkaido, Honshu).

Host: Unknown.

44. *Lasiomma divergens* Fan et Zhang, 1982

Lasiomma divergens Fan et Zhang, 1982, Journ. North-East. For. Inst. 1: 9.

Lasiomma divergens: Suwa, 1983b, Nat. & Lif. 13(2): 29-30^①.

Type-locality: China (Heliongjiang).

Locality: Mt. Odaesan (=Odae-san^①).

Distribution: Korea, China (Helionjiang).

Host: Unknown.

45. *Lasiomma monticola* sp. nov.

Description

Male: General coloration black, with greyish pollinose. Head about 1.4-1.5 times as high as long in profile; frons 0.6-0.7 times as wide as diameter of anterior ocellus; parafrontalia broadly convergent each other; frons and parafacialia more or less brownish near lunule; cheek dull grey pubescent; profrons a little narrower than half width of A3 in profile; antenna black, A3 about 1.5-1.6 times as long as wide, with arista minutely pubescent, the longest hair approximately equal to basal diameter of arista; palpus and haustellum black; mentum sparsely greyish pollinose.

Thorax purple greyish pollinose; mesonotum bearing distinct brownish median and sublateral vittae; scutellum brownish on dorsum; legs black.

Wing tinged with dark brown; m-m slightly bowed inwards at middle; calyptra pale; knob of halter brownish yellow.

Chaetotaxy: Frons: 3 *ori*, 1 *if*; mesonotum: 3 *pre acr*, lacking accessory setulae between the rows; secondary *ph* remarkably shorter than primary one and *pra* respectively; mesopleuron: 1 anterior *mpl*, 1 strong and a few fine *pstg*; *stpl* 2: 3; t1: 0-1 *pd*, 1 *pv*; f2: some slender *pv*, no *av*; t2: 1 *ad*, 1 *pd*, 2 weak *p-pv*; f3: a row of robust *av*, a few *pv* on basal half; t3: 6 *ad*, 2 *av*, 3 *pd*, 3 *pv*; costal thorns weak.

Genitalia: Cercal plate subrectangular, with long setae on each lateral distal half, distinctly sinuate in profile; 5th sternite simply with some long setae on outer margin; preparamere with 2 strong setae on upper margin and apex respectively; postparamere slender, with 1 strong seta and a few microsetae; epiphallus large, with apex directing backwards, distiphallus trifurcate in ventral view.

Length: Body 6.2-6.3 mm, wing 5.3-5.4 mm.

Female: Unknown.

Type-examined: Holotype male, Mt. P'algongsan, GB, S. Korea, 12, V, 1983, coll. Y.J. Kwon; paratype: 1 male, Mt. Sölaksan, GW, C. Korea, 30, VI, 1984, coll. Y.J. Kwon.

Host: Unknown.

Remark: This new species resembles *Lasiomma meadei* Kowarz, 1880 in external feature, but distinctly separated from it by the male genitalic characteristics.

46. *Lasiomma meadei* (Kowarz, 1880)

Lasiops Meadei Kowarz, 1880, Mitt. Munchn. Ent. Ver. 4: 131.

Lasiomma adelpha + *L. parviceps* Kowarz, 1880, Ibid. 4: 132-133.

Lasiomma adelpha + *L. parviceps* (nec Kowarz): Seguy, 1923, Faun. Franc. 6: 136-137.

Opsolasia Meadei: Ringdahl, 1959, Svensk Ins. II, Dipt. Musc. 3: 273.

Lasiomma meadei: Hennig, 1967, Flieg. pal. Reg. 63a: 188-189, pls. 11(183, 195), 14(224).

Lasiomma meadei: Kwon et Suh. 1982d, Kor. Journ. Ent. 12(2): 2-3 ⁽¹⁾.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Lasiomma meadei: Suwa, 1983b, Nat. & Lif. 13(2): 30^{②-③}.

Type-locality: England.

Locality: GW : Mt. Odaesan (=Odaesan^③), Mt. Sölsaksan (=Solag-san^②, Mt. Seolaksan^①).

Distribution: Korea, Japan (Hokkaido, Honshu, Kyushu), Europe.

Host: The larvae are living in the corps of birds or excrements of men.

Genus 15. *Chirosia* Rondani, 1856

Chirosia Rondani, 1856, Dipt. Ital. Prodr. 1: 102.

Type-species: *Aricia albitarsis* Zetterstedt, 1845

Type-locality: Sweden.

Pachystoma Lioy, 1864, Att. Ist. Ven. 3(9): 910.

Type-species: *Anthomyia crassirostris* Meigen, 1826

Type-locality: Germany.

Rhadina Kowarz, 1893, Wien. Ent. Zeitg. 12: 144.

Type-species: *Chirosia montana* Porkorny, 1893

Type-locality: Europe.

Pycnoglossa Coquillett, 1901, Proc. U.S. Nat. Mus. 23: 613.

Type-species: *Musca flavipennis* Fallen, 1823

Type-locality: Germany.

Pogonomyza Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 9: 99-100.

Type-species: *Musca flavipennis* Fallen, 1823

Type-locality: Germany.

Key to species of *Chirosia*

1. Middle femur with strong *av* *Chirosia cinerosa*
— Middle femur without strong *av* 2
2. Fore tibia usually without *ad*; hind tibia with 7-16 *pv* *Chirosia betuleti*
— Fore tibia with 1 *ad*; hind tibia with 2 fine *pv* *Chirosia inspinatu*

47. *Chirosia cinerosa* (Zetterstedt, 1845)

Aricia cinerosa Zetterstedt, 1845, Dipt. Scand. 4: 1450.

Aricia xanthoptera Boheman, 1863, Öfv. K. Vet. Akad. Forh. 1863, 2: 13.

Hylemyia (*Pogonomyza*) *cinerosa*: Schnabl & Dziedzick, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 95: 99-100.

Pycnoglossa luteipennis Ringdahl, 1937, Op. Ent. 2: 126.

Pycnoglossa cinerosa: Hockett, 1949, Journ. N.Y. Ent. Soc. 57: 59.

Chirosia cinerosa: Collin, 1955, Journ. Soc. Brit. Ent. 5: 97.

Chirosia cinerosa: Kwon et Suh, 1982b, Kor. Journ. Plant Prot. 21(4): 179-180^①.

Type-locality: Denmark.

Locality: GG : Mt. Myōngsōngsan, Mt. Soyosan.

GW : Mt. Ch'iaksan, Mt. Obongsan^①.

Distribution: Korea, Japan (Hokkaido), Europe, N. America.

Host: *Struthiopteris* sp.

48. *Chirosia betuleti* (Ringdahl, 1935)

Hylemyia (*Melinia*) *betuleti* Ringdahl, 1935, Not. Ent. 15: 30.

Melinia carinata Tiensuu, 1939, Ann. Ent. Fenn. 5: 245.

Melinia betuleti: Ringdahl, 1959, Svensk Ins. 11, Dipt. Musc. 3: 205.

Chirosia betuleti: Hennig, 1966, Flieg. pal. Reg. 63a: 58-59, pls. 2(22), 5(81).

Chirosia betuleti: Suwa, 1983b, Nat. & Lif. 13(2): 24^①.

Type-locality: Sweden.

Locality: GW : Mt. Odaesan (=Odae-san^①).

Distribution: Korea, Japan (Hokkaido, Honshu), Europe.

Host: *Athyrium* sp.

49. *Chirosia inspinata* Suwa, 1983

Chirosia inspinata Suwa, 1983b, Nat. & Lif. 13(2): 24-26^①.

Type-locality: Korea.

Locality: GN : Mt. Chirisan (=Jiri-san^①).

Distribution: Korea.

Host: Unknown.

Genus 16. *Egle* Robineau-Desvoidy, 1830

Egle Robineau-Desvoidy, 1830, Ess. Myod.: 584.

Type-species: *Egle parva* Robineau-Desvoidy, 1830

Type-locality: France.

Xenophorbia Malloch, 1920, Trans. Amer. Ent. Soc. 46: 175.

Type-species: *Stomoxys muscaria* Fabricius, 1777

Type-locality: Germany.

Key to species of *Egle*

1. Mesonotum with 4 pairs of *post dc*; notopleuron with some accessory setulae *Egle muscaria*
- Mesonotum with 3 pairs of *post dc*; notopleuron lacking accessory setulae 2

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

2. 5th sternite with some strong setae at base of each process in male 3
 —. 5th sternite without strong seta at base of each process in male 4
3. Hind femur with extra long setae on full length of *av* and *pv* surfaces, much longer than height of femur *Egle longipalpis*
 —. Hind femur with nearly all setae on proximal half of *av* and *pv* surfaces, scarcely longer than height of femur *Egle parvaeformis*
4. Mesopleuron with 6-7 *pstg*; cercal plate with apical projection strongly constricted at base *Egle parva*
 —. Mesopleuron with 3-4 *pstg*; cercal plate with apical projection hardly constricted at base 5
5. Smaller species, body length 2.5-3 mm; surstylus with rather expanded apex *Egle podulparia* sp. nov.
 —. Larger species, body length 3-3.5 mm; surstylus not expanded at apex *Egle korpokkur*

50. *Egle muscaria* (Fabricius, 1777)

Stomoxys muscaria Fabricius, 1777, Gen. Ins.: 308.

Anthomyia determinata + *Eriphia ciliata* Walker, 1849, List Dipt. Brit. Mus. 4: 954, 961.

Corthophila palpella Rondani, 1870, Bull. Soc. Ent. Ital. 2: 328.

Chortophila (Egle) muscaria: Seguy, 1923, Faun. Franc. 6: 103-104.

Hylemyia (Egle) muscaria: Hockett, 1928, Bull. Brooklyn Ent. Soc. 23: 73.

Egle muscaria: Tiensuu, 1935, Act. Soc. Faun. Flor. Fenn. 58(4): 14.

Type-locality: Germany.

Description

Male. General coloration black, with blue greyish pollinose. Head rather higher than long in profile; frons about as wide as distance between posterior ocelli exclusive; parafrontalia nearly convergent each other; parafacialia and cheek subshining, greyish pruinose; profrons somewhat wider than A3-width; epistoma projecting forwards beyond tip of profrons; antenna black, with arista minutely pubescent, A3 a little longer than wide; haustellar mentum blackish and faintly pollinose.

Thorax pale greyish pollinose, more or less tinged with bluish; mesonotum with obscure brownish median and sublateral vittae; legs black.

Wing faintly blackish tinged and denser at base; m-m nearly straight; calyptra clear or thinly dark yellowish tinged; knob of halter dark brown.

Chaetotaxy: Frons: 9-10 *ori*, 1 fine *if*; mesonotum: 4 strong *post dc*; secondary *ph* longer than primary one; notopleuron with some accessory setulae; *pra* slightly shorter than anterior *ntpl*; mesopleuron: 1 strong and 4-6 accessory *pstg*; *stpl* 0: 2; *t1*: 2-3 *pd*, 3 *pv*; *t2*: 2-3 *pd*, 2 *pv*; *t3*: 3-6 *ad*, 4 *pd*.

Genitalia: Cercal plate with slender apical projection, of which apex slightly sunken; surstylus roundly protruded on inner subbasal margin, concave on middle posterior margin in lateral aspect; 5th sternite with a conical process on outer subapical margin; preparamere 2 strong

setae on posterior margin; postparamere 1 strong seta on middle portion; basiphallus sub-triangular, epiphallus very small conical and degenerated, distiphallus slender with sharply bifurcate at apex.

Length: Body 4.4-5.8 mm, wing 3.6 4.8 mm.

Female: Less densely haired than in male; frons a little narrower than half of head-width, with 5 *ori*, 4 *ors* and 1 *if*.

Length: Body 4.1-5.2 mm, wing 3.8-5.0 mm.

Locality: GB : Mt. Naeyönsan, Mt. P'algongsan, Taegu.

Distribution: Korea (new record), Japan (Hokkaido), U.S.S.R. (Kamchatka), Europe, N. America.

Host: *Populus* spp., *Salix* spp.

51. *Egle longipalpis* Malloch, 1924

Hylemyia (Egle) longipalpis Malloch, 1924, Psych. Camb. Mass. 21: 197.

Egle longipalpis: Suwa, 1974, Ins. Mats. n.s. 4: 89-90.

Type-locality: N. America.

Description

Male: General coloration black, with white greyish pollinose. Head a little higher than long in profile; frons about as wide as distance between posterior ocelli exclusive; parafacialia and cheek whitish pruinose; profrons about as wide as A3-width; epistoma rather distinctly extending forwards beyond tip of profrons; antenna black, with arista minutely pubescent, A3 only a little longer than wide; haustellum and palpus slender and black.

Thorax blue greyish pollinose; mesonotum with obscure median and sublateral vittae; legs, black, 1st tarsal segment much longer than 2nd and 3rd segment combined.

Wing faintly black tinged, denser at base; m-m nearly straight; calyptra clear and with margin more or less yellowish; knob of halter dark brown.

Abdomen with broad median vitta and broad fore marginal bands on each tergite.

Chaetotaxy: Frons: 4-5 *ori*, 1 minute *ors*, 1 *if*; mesonotum: 3 *pre acr*, without accessory setulae between the rows; secondary *ph* slightly longer than primary one; notopleuron: no accessory setulae; *pra* as long as anterior *ntpl*; mesopleuron: 3-4 *pstg*; t1: 1 *pd*, 1 *pv*; t2: 2 *pd*, 1 *p*, 1 *pv*; t3: 7-8 *ad*, 5-6 *av*, 5-6 *pd*.

Genitalia: Cercal plate with slender apical projection, of which apex slightly sunken; surstylus tapered at apex, in lateral view with a rectangular process at base; 5th sternite with 4-5 strong setae on outer middle margin; preparamere rectangular, with 2 setae on posterior margin; postparamere slender, with apex finger-like; epiphallus slender, distiphallus slender, with rectangular process on subapex and sharply pointed apex in lateral view.

Length: Body 3.2-3.8 mm, wing 3.1 3.6 mm.

Female: Unknown.

Locality: GB : Mt. Naeyönsan, Mt. P'algongsan, Taegu.

S.J.SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Distribution: Korea (new record), Japan (Hokkaido), N. America.

Host: *Populus* spp., *Salix* spp.

52. *Egle parvaeformis* Schnabl, 1911

Egle steini var. *parvaeformis* Schnabl, 1911, Nov. Act., Abh. Leop-Carol. Akad. Nat. 95: 105.

Egle parvaeformis: Tiensuu, 1935, Act. Soc. Faun. Flor. Fenn. 58(4): 14.

Type-locality: Europe.

Description

Male: General coloration black, with blue greyish pollinose. Head about 1.2-1.3 times as high as long in profile; frons slightly narrower than diameter of anterior ocellus; parafacialia and cheek with silvery pruinescence; profrons as wide as A3-width; epistoma scarcely extend to a level beyond tip of profrons; antenna black, with arista minutely pubescent, A3 only a little longer than wide; haustellum and palpus black.

Thorax blue greyish pollinose; mesonotum with a broad median vitta and a pair of narrow sublateral vittae along rows of *dc*; legs black, 1st tarsal segment much longer than 2nd and 3rd segments combined.

Wing faintly tinged with dark brown, denser at base; m-m nearly straight; calyptra hyaline or thinly blackish tinged; knob of halter dark brown.

Chaetotaxy: Frons: 4 *ori*, 1 minute *ors*, 1 *if*; mesonotum: 3 *pre acr*, 3 *post dc*; secondary *ph* about as long as primary one; notopleuron: no accessory setulae; *pra* shorter than anterior *ntpl*; t1: 2 *pd*, 1 *pv*; t2: 2-3 *pd*; t3: 2-5 *ad*, 2 *av*, 3-4 *pd*.

Genitalia: Cercal plate with subapex rather convex; surstylus roundly protrudent on middle inner margin, convex on middle posterior margin in lateral aspect; 5th sternite with some strong setae at base of each process; preparamere rectangular, much longer than wide, with 2 strong setae on posterior margin; postparamere without seta; basiphallus subquadrate, epiphallus degenerate, distiphallus somewhat trumpet-like.

Length: Body 3.1-3.6 mm, 2.8-3.2 mm.

Female: Frons a little narrower than half of head width, with 5 *ori*, 4 *ors* and 1 *if*.

Length: Body 3.0-3.5 mm, wing 2.8-3.2 mm.

Locality: GB : Hayang Up, Mt. Naeyönsan, Mt. P'algongsan, Taegu.

Distribution: Korea (new record), Europe, N. America.

Host: *Populus* spp., *Salix* spp.

53. *Egle parva* Robineau-Desvoidy, 1830

Egle parva Robineau-Desvoidy, 1830, Ess. Myod.: 590.

Type-locality: France.

Description

Male: General coloration black, with blue greyish pollinose. Head slightly higher than long in profile; frons about as wide as diameter of anterior ocellus; parafacialia and cheek subshining and grey pruinose; profrons much narrower than A3-width; epistoma projecting forwards beyond tip of profrons; antenna black, with arista minutely pubescent, A3 a little longer than wide; haustellum and palpus black and slender.

Thorax blue greyish pollinose; mesonotum with broad median and sublateral vittae; legs black, 1st tarsal segment much longer than 2nd and 3rd segments combined.

Wing thinly tinged with dark brown, denser at base; m-m slightly sinuate; calyptra whitish; halter dark brown.

Chaetotaxy: Frons: 4-5 *ori*, 1 minute *ors*, 1 *if*; mesonotum: 3 *pre acr*, lacking accessory setulae between the rows; secondary *ph* about as long as primary one; mesopleuron: 6-7 *pstg*, 1 distinct anterior *mpl*; *stpl* 1: 2; *t1*: 2 *pd*, 1 *pv*; *t2*: 1 *pd*, 1 *pv*; *t3*: 5-8 *ad*, 4 *av*, 3-4 *pd*, 6-7 *pv*.

Genitalia: Cercal plate with apical projection strongly constricted at base; surstylus short, with roundly produced inner middle margin, in lateral aspect curved backwards; 5th sternite with many fine setulae on inner margin of each process; preparamere much longer than wide, with 2 setae on upper and middle posterior margin; postparamere slender, apex tapered; epiphallus short rod-shaped, distiphallus sharply pointed apically in lateral view.

Length: Body 2.5-3.4 mm, wing 2.4-3.2 mm.

Female: Unknown.

Locality: GB : Mt. Naeyönsan, Mt. P'algongsan, Taegu.

Distribution: Korea (new record), Japan (Hokkaido), U.S.S.R. (Kamchatka), Europe.

Host: *Populus* spp., *Salix* spp.,

54. *Egle podulparia* sp. nov.**Description**

Male: General coloration black, with blue greyish pollinose. Head slightly higher than long in profile; frons a little narrower than diameter of anterior ocellus; parafrontalia nearly contiguous caudad; profrons and cheek dull greyish pruinose; profrons somewhat narrower than A3-width; epistoma distinctly projecting forward beyond tip of profrons; antenna dark brownish, with arista minutely pubescent, A3 only a little longer than wide; palpus and haustellum dark brownish and slender.

Thorax blue greyish pollinose, more or less brownish tinged; mesonotum with obscure broad median and sublateral vittae; legs black, with 1st tarsal segment much longer than 2nd and 3rd segments combined.

Wing faintly tinged with dark brown, denser at base; m-m nearly straight; calyptra and halter dark brown.

Abdomen blue greyish pollinose; median vitta subtriangular and dilated anteriorly at each tergite.

Chaetotaxy: Frons: 4 *ori*, 1 minute *ors*, 1 *if*; genal setae in two rows, the setae of lower row are fewer in number and usually not curved upwards; mesonotum: 3 *pre acr*, lacking accessory setulae between the rows; secondary *ph* rather shorter than primary one; *pra* shorter than

S.J.SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

anterior *ntpl*; notopleuron without accessory setulae; mesopleuron: 3-4 *pstg*; *stpl* 1: 2; *t1*: 1 *pd*, 1 *pv*; *t2*: 1 *pd*; *t3*: 6-8 *ad*, 3-4 *av*, 5-6 *pd*, 4-5 *pv*.

Genitalia: Cercal plate with apical projection hardly constricted at base; surstylus with apex rather expanded, in lateral aspect nearly straight; 5th sternite without strong setae; preparamere rectangular, much longer than wide, with 2 setae on posterior margin; postparamere sinuate and slender; epiphallus somewhat trumpet-like, distiphallus slender with apex sharply pointed in lateral aspect.

Length: Body 2.6-2.9 mm, wing 2.5-2.7 mm.

Female: Unknown.

Type-examined: Holotype male, Mt. Naeyŏnsan, GB, S. Korea, 2, IV, 1984, coll. Y.J. Kwon; paratypes: 3 males, the same data as holotype.

Host: *Salix* spp.

Remark: This new species closely resembles *Egle korpokkur* Suwa, 1974, but is separated well from it by the male genitalic characteristics.

55. *Egle korpokkur* Suwa, 1974

Egle korpokkur Suwa, 1974, Ins. Mats. n.s. 4: 91-92.

Type-locality: Japan.

Description

Male: General coloration black, with blue greyish pollinose which is more or less tinged with brown. Head slightly higher than long in profile; frons about as wide as or a little narrower than diameter of anterior ocellus; parafacialia and cheek dull greyish pruinose; profrons rather narrower than A3-width; epistoma distinctly projecting forwards beyond tip of profrons; antenna black, with arista minutely pubescent A3 about 1.2-1.3 times as long as wide.

Thorax greyish pollinose and tinged with bluish brown; mesonotum with broad median and sublateral vittae; legs black, 1st tarsal segment much longer than 2nd and 3rd segments combined.

Wing tinged with dark brown, denser at base; m-m nearly straight; calyptra and halter dark brown.

Abdomen blue greyish pollinose; median vitta broad and dilated anteriorly on each tergite, and often triangulate.

Chaetotaxy: Frons: 4-5 *ori*, 1 minute *ors*, 1 *if*; genal setae in two rows, the setae of the lower row are fewer in number and usually not curved upwards; mesonotum: 2-3 *pre acr*, 3 *post dc*; secondary *ph* shorter than primary one; *pra* slightly shorter than anterior *ntpl*; notopleuron: no accessory setulae; mesopleuron: 3-4 *pstg*; propleuron: 1 strong *prpl*; *stpl* 1: 2; *t1*: 1 *pd*, 1 *pv*; *t2*: 1 *pd*, 0-2 *pv*; *t3*: 4-6 *ad*, 2-4 *av*, 3-4 *pd*, 4-6 *pv*.

Genitalia: Cercal plate with apical projection hardly constricted at base; surstylus with apex tapering, in lateral view nearly straight and with a small conical process on middle posterior margin; 5th sternite without strong setae; preparamere somewhat rectangular, much shorter than wide, with 2 setae on posterior margin; postparamere slender and sinuate; epiphallus rather trumpet-like, distiphallus slender and sinuate, with apex sharply pointed in lateral view.

Length: Body 3.1-3.6 mm, wing 3.0-3.4 mm.

Female: Unknown.

Locality: Naeyŏnsan, Mt. P'algongsan, Taegu.

Distribution: Korea (new record), Japan (Hokkaido).

Host: *Populus* spp., *Salix* spp.

Genus 17. *Adia* Robineau-Desvoidy, 1830

Adia Robineau-Desvoidy, 1830, Ess. Myod.: 558.

Type-species: *Adia oralis* Robineau-Desvoidy, 1830

Type-locality: Europe.

56. *Adia cinerella* (Fallen, 1825)

Musca cinerella Fallen, 1825, Mon. Musc. Suec. 8: 77.

Anthomyia pusilla Meigen, 1826, Syst. Besch. 5: 151.

Anthomyia trigonomaculata + *A. virescens* Macquart, 1859, Dipt. exort., suppl. 4: 266.

Aricia interruptilinea Zetterstedt, 1860, Dipt. Scand. 14: 232.

Aricia remorata Holmgren, 1883, Ent. Tidskr. 4: 171.

Adia cinerella: Stein, 1892, Ent. Nachr. Berl. 18: 329.

Egle trigonigaster + *Chortophila excubans* Pandelle, 1900, Rev. Ent. Franc. 19, Musc.: 242, 282.

Paregle cinerella: Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 95: 95.

Chortophila (Paregle) cinerella: Seguy, 1923, Faun. Franc. 6: 107.

Hylemyia (Paregle) cinerella: Fan, 1965, Keys comm. flies Chin.: 52^①.

Paregle cinerella: Suwa, 1981a, Kontyû 49(1): 104^②.

Paregle cinerella: Sun et Zhang, 1982, Ins. Xiz. II: 205-206 (Korea).

Adia cinerella: Michelsen, 1983, Ent. Scand. 14: 111.

Paregle cinerella: Suwa, 1983b, Nat. & Lif. 13(2): 31^{③-⑦}.

Type-locality: Sweden.

Locality: CN : Mallip'o (=Manlipo^⑤).

GB : Changsa (=Jangsa near Pohan^⑥), Mt. Sobaeksan, Taegu, Tansan Myŏn.

GN : Mt. Chirisan (=Jiri-san^⑦), Mt. Kŭmsan.

GW : Mt. Obongsan, Mt. Odaesan (=Odae-san^④), Mt. Sŏlaksan (=Seolag-san^③).

JJ : Mt. Hallasan^① (=Ryuzinkaku, Mt. Hanna^②).

Host: The larvae live on cow dung.

Genus 18. *Paregle* Schnabl, 1911

Paregle Schnabl, 1911, Deutsch. Ent. Zeitschr.: 71.

Type-species: *Musca radicum* Linnaeus, 1758

Type-locality: Europe.

S.J.SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

57. *Paregle vetula* (Zetterstedt, 1838)

Anthomyza vetula Zetterstedt, 1838, Ins. Lapp.: 682.

Aricia naso Zetterstedt, 1845, Dipt. Scand. 4: 1551.

Hylemyia (Paregle) vetula: Schnabl & Dziedzick, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 95: 95.

Hylemyia (Chionomyia) vetula: Ringdahl, 1933, Ent. Tidskr. 54: 30.

Chionomyia vetula: Henning, 1967, Flieg. pal. Reg. 63a: 171-172, pls. 10(165), 12(190), 14(213).

Paregle vetula: Suwa, 1874, Ins. Mats. n.s. 4: 93-94.

Type-locality: Sweden.

Description

Male: General coloration purplish black. Head 1.2-1.3 times as high as long in profile; frons about equal to distance between posterior ocelli exclusive; parafrontalia widely separate; profrons and cheek blackish, with some pale brownish reflections; interfrontalia dull, becoming dark reddish at base of antenna; antenna black, with arista minutely pubescent, A3 1.5-2.0 times as long as wide; epistoma projecting forwards at most as far as tip of profrons.

Thorax black, tinged with purplish; mesonotum with obscure broad median and sublateral vittae.

Wing black tinged, denser at base; m-m straight; calyptra deep yellow; knob of halter dark brown.

Abdomen purplish brown pollinose, which is more or less tinged with bluish, with broad median vitta and broad fore marginal bands on each tergite.

Chaetotaxy: Eye bearing numerous hair; frons with 14-16 long *ori*, 1 slender *ors*, no *if*; thorax with many slender accessory setulae on dorsum, but notopleuron without accessory setulae; *pra* as long as posterior *ntpl*; mesopleuron: 10-20 accessory *pstg*; t1: 2 *ad*, 3-4 *pd*, 3-7 slender *pv*; t2: 2 *ad*, 1-2 *av*, 3 *pd*, 13 *pv*; t3: innumerable setulae.

Genitalia: Cercal plate subtriangular, with long setae on each lateral margin; surstylus slender with small process on inner apical margin, in lateral view remarkably bowed forwards at middle portion; preparamere armed with 2 strong setae; postparamere with 1 long and 1 short setae; basiphallus rectangular, distiphallus strongly developed with apex U-shaped in lateral aspect.

Length: Body 6.6-8.3 mm, wing 5.9-7.4 mm.

Female: Body brown greyish pollinose; frons a little narrower than half of head-width; interfrontalia: 1 strong *if*; parafrontalia: 4-6 strong *ors*, 5-9 *ori*.

Length: Body 6.7-8.7 mm, wing 6.5-8.2 mm.

Locality: GB : Mt. P'algongsan, Taegu.

Distribution: Korea (new record), Japan (Hokkaido), China (Manchuria), Europe.

Host: The larvae feed on cow dung.

Genus 19. *Hydrophoria* Robineau-Desvoidy, 1830

Hydrophoria Robineau-Desvoidy, 1830, Ess. Myo.: 503.

Type-species: *Hydrophoria littoralis* Robineau-Desvoidy, 1830

Type-locality: Europe.

Key to species of *Hydrophoria*

1. Hind tibia usually without *p*; abdomen yellowish in ground color basally *Hydrophoria ruralis*
- Hind tibia with *p*; abdomen blackish in ground color basally *Hydrophoria montana*

58. *Hydrophoria ruralis* (Meigen, 1826)

Anthomyia ruralis Meigen, 1826, Syst. Besch. 5: 101.

Hydrophoria ruralis: Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop-Carol. Akad. Nat. 95: 102.

Hydrophoria (s. str.) *ruralis*: Fan, 1965, Keys comm. flies Chin.: 42 ^①.

Hydrophoria ruralis: Park, 1967, Kor. Journ. Zool.: 9-10 ^{②-④}.

Hydrophoria ruralis: Suwa, 1981a, Kontyû 49(1): 103 ^⑤.

Hydrophoria ruralis: Suwa, 1983b, Nat. & Lif. 13(2): 40 ^{⑥-⑩}.

Type-locality: Europe.

Locality: GB : Changsa (=Jangsa near Pohan^⑦), Hayang Ŭp, Mt. Mwangaksan (=Mt. Hwangak^②), Mt. P'algongsan (=Mt. Palgong^④, Palgong-san^⑩, Mt. Pal-kon^⑤).

GG : Seoul.

GN : Mt. Chirisan^① (=Jiri-san^⑧), Ch'ilwŏn Myŏn, Mt. Kayasan (=Mt. Kaya^③, Kaya-san^⑨), Mt. Kŭmsan, Mt. Wŏnhyosan.

GW : Mt. Obongsan, Mt. Odaesan (=Odae-san^⑥), Mt. Sŏlaksan.

JN : Mt. Chogyesan.

Distribution: Korea, Japan (whole), China (Chekiang, Kiangsu, Manchuria, Yunnan), U.S.S.R. (Maritime Territory), N. America.

Host: Unknown.

59. *Hydrophoria montana* Suwa, 1970

Hydrophoria montana Suwa, 1970, Kontyu 38(3): 248-251.

Hydrophoria montana: Suwa, 1983b, Nat. & Lif. 13(2): 40^①.

Type-locality: Japan.

Locality: GW : Mt. Odaesan (=Odae-san^①).

JN : Mt. Turyunsan.

Distribution: Korea, Japan (Honshu, Shikoku).

Host: Unknown.

Genus 20. *Leucophora* Robineau-Desvoidy, 1830

Leucophora Robineau-Desvoidy, 1830, Ess. Myod.: 562.

Type-species: *Leucophora cinerea* Robineau-Desvoidy, 1830

Type-locality: Germany.

S.J.SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Ocromyia Lioy, 1864, Att. Inst. Ven. 3(9): 910.

Type-species: *Hylemyia pallida* Macquart, 1835

Type-locality: France.

Hylephila Rondani, 1877, Dipt. Ital. Prod. 6: 13.

Type-species: *Musca buccata* Fallen, 1824

Type-locality: France.

Hammomyia Rondani, 1877, Dipt. Ital. Prod. 6: 13.

Type-species: *Aricia albescens* Zetterstedt, 1845

Type-locality: Europe.

Ammomyia Stein, 1910, Arch. Nat. 81A (10: 163.

Type-species: *Aricia albescens* Zetterstedt, 1845

Type-locality: Europe.

Key to species of *Leucophora*

1. Arista plumose, the longest hair being longer than A3-width; 3rd antennal segment exceeding twice as long as wide *Leucophora grisella*
— Arista shortly or minutely pubescent, the longest hair being at most about as long as basal diameter of arista; 3rd antennal segment less than twice as long as wide 2
2. Middle tibia without *v*; hind tibia with apical *pd* weak or vestigial . . . *Leucophora sponsa*
— Middle tibia with strong *v*; hind tibia with apical *pd* strong 3
3. Bristle of *pra* shorter than posterior *ntpl*; cheek with a row of genal setae
. *Leucophora unistriata*
— Bristle of *pra* longer than posterior *ntpl*; cheek with 2 row of genal setae
. *Leucophora personata*

60. *Leucophora grisella* Hennig, 1967

Musca grisea Fallen, 1823, Mon. Musc. Suec. 6: 57 (nom. praeocc.).

Leucophora grisella Hennig, 1967, Flieg. pal. Reg. 63a: 120-121, pls. 7(119), 8(127).

Leucophora grisella: Suwa, 1983b, Nat. & Lif. 13(2): 26 ^①.

Type-locality: Europe.

Locality: GW : Mt. Odaesan (=Odae-san ^①).

Distribution: Korea, Japan (Honshu), Europe.

Host: The larvae live in the nest of *Rhophites quinquespinosus*, *Panurgus calcaratus* and *Halic-tus malachurus*.

61. *Leucophora sponsa* (Meigen, 1826)

Anthomyia sponsa Meigen, 1826, Syst. Besch. 5: 147.

Hylephila sponsa; Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat.

95: 91-92.

Leucophora sponsa: Hennig, 1967, Flieg. pal. Reg. 63a: 131-132, pls. 7(118, 121), 8(129).

Leucophora sponsa: Suwa, 1983b, Nat. & Lif. 13(2): 26

Type-locality: Europe.

Locality: GW : Mt. Odaesan (=Odae-san^②), Mt. Sölaksan (=Seolag-san^①).

Distribution: Korea, Japan (Hokkaido, Honshu), Europe.

Host: Unknown.

62. *Leucophora unistriata* (Zetterstedt, 1838)

Anthomyza unistriata Zetterstedt, 1838, Ins. Lapp.: 677.

Hammomyia paludis Johannsen, 1917, Ent. News 28: 323.

Hylephila unistriata: Collin, 1921, Trans. Ent. Soc. Lond.: 319, p. 110(11).

Hylephila pleskei Seguy, 1925, Journ. off. Rep. franc.: 3811.

Leucophora unistriata: Huckétt, Journ. N. Y. Ent. Soc. 48: 352.

Leucophora unistriata: Suwa, 1983b, Nat. & Lif. 13(2): 26^{①-②}.

Type-locality: Sweden.

Locality: GW : Mt. Odaesan (=Odaesan^②), Mt. Sölaksan (=Seolag-san^①).

Distribution: Korea, Japan (Hokkaido), Europe, N. America.

Host: The larvae live in the nest of Hymenoptera.

63. *Leucophora personata* (Collin, 1921)

Hylephila personata Collin, 1921, Trans. Ent. Soc. Lond.: 318, pl. 10(10, 12, 13).

Leucophora personata: Hennig, 1967, Flieg. pal. Reg. 63a: 125-126, pls. 7(114), 8(125).

Leucophora personata: Kwon et Suh, 1982d, Kor. Journ. Ent. 12(2): 2^①.

Type-locality: Europe.

Locality: GB : Mt. P'algongsan (=Mt. Palgongsan^①).

Distribution: Korea, Japan (Hokkaido), Europe.

Host: The larvae live on pollen or honey stored by andrenid bees.

Genus 21. *Delia* Robineau-Desvoidy, 1830

Delia Robineau-Desvoidy, 1830, Ess. Myod.: 571.

Type-species: *Delia floricola* Robineau-Desvoidy, 1830

Type-locality: France.

Trigonostoma Liroy, 1864, Att. Ist. Ven. 3(9): 990.

Type-species: *Chortophila frontalis* Macquart, 1835

Type-locality: France.

S.J.SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

- Gastrolepta* Lioy, 1864, Att. Ist. Ven. 3(9): 990.
Type-species: *Musca coarctata* Fallen, 1825
Type-locality: Sweden.
- Eriosischia* Lioy, 1864, Att. Ist. Ven. 3(9): 991.
Type-species: *Chortophila floccosa* Macquart, 1835
Type-locality: France.
- Leptohylemyia* Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 95: 94.
Type-species: *Musca coarctata* Fallen, 1825
Type-locality: Sweden.
- Crinura* Schnabl & Dziedzicki, 1911, Nov. Act. Abh. Leop.-Carol. Akad. Nat. 95: 95-96.
Type-species: *Anthomyia platura* Meigen, 1926
Type-locality: Europe.
- Flavena* Karl, 1928, Tierw. Deutschl. 13, Musc.: 147.
Type-species: *Anthomyza criniventris* Zetterstedt, 1860
Type-locality: Sweden.
- Tricharia* Karl, 1928, Tierw. Deutschl. 13, Musc.: 160.
Type-species: *Chortophila trichodactyla* Rondani, 1866
Type-locality: Italy.
- Chortophilina* Karl, 1928, Tierw. Deutschl. 13, Musc.: 203.
Type-species: *Chirosia fallax* Loew, 1873
Type-locality: Europe.
- Bisetaria* Karl, 1943, Stett. Ent. Zeitg. 104: 65.
Type-species: *Chortophila quadripila* Stein, 1916
Type-locality: Sweden.
- Subdelia* Karl, 1943, Stett. Ent. Zeitg. 104: 65.
Type-species: *Musca floralis* Fallen, 1824
Type-locality: Sweden.
- Atrichodelia* Karl, 1943, Stett. Ent. Zeitg. 104: 66.
Type-species: *Chortophila flavidipennis* Stein, 1916
Type-locality: Finland.
- Gymnodelia* Karl, 1943, Stett. Ent. Zeitg. 104: 66.
Type-species: *Chortophila flavidipennis* Stein, 1916
Type-locality: Finland.
- Leucodelia* Karl, 1943, Stett. Ent. Zeitg. 104: 66.
Type-species: *Aricia candens* Zetterstedt, 1845
Type-locality: Sweden.
- Monodelia* Karl, 1943, Stett. Ent. Zeitg. 104: 66.
Type-species: *Anthomyia longicauda* Strobl, 1898
Type-locality: Alps.

Trichohylemyia Karl, 1943, Stett. Ent. Zeitg. 104: 66.

Type-species: *Trichohylemyia testaceifrons* Karl, 1943

Type-locality: Germany.

Chaetodelia Karl, 1943, Stett. Ent. Zeitg. 104: 66.

Type-species: *Phorbia exigua* Meade, 1883

Type-locality: England.

Key to species of *Delia*

1. Frons wider or only a little narrower than one-third head-width in male 2
 —. Frons much narrower, nearly contiguous in male 3
2. Frons 0.3-0.4 times as wide as head-width in male; *pra* present . . . *Delia expansa* sp. nov.
 —. Frons about 0.25 times as wide as head-width in male; *pra* absent
 *Delia hystricosternita*
3. Fore tibia with apical *pv* strong and blunt apically 4
 —. Fore tibia with apical *pv* weak, if strong it is not blunt apically 8
4. Epistoma projecting forwards beyond tip of profrons; *pra* longer than posterior *ntpl*
 *Delia longitheca*
 —. Epistoma sinuated behind frons at lunule; *pra* shorter than posterior *ntpl* 5
5. Middle tibia without *ad* *Delia tenuiventris*
 —. Middle tibia with *ad* 6
6. Middle metatarsus with some long setae on dorsal surface *Delia tumidula*
 —. Middle metatarsus without long setae on dorsal surface 7
7. Hind tibia with more than 20 *pv* on whole length; frons usually narrower than anterior ocellus *Delia platura*
 —. Hind tibia with less than 20 *pv* on basal half to two-thirds; frons usually wider than anterior ocellus *Delia antiqua*
8. *Pra* longer than posterior *ntpl* 9
 —. *Pra* distinctly shorter than posterior *ntpl* 11
9. Middle tibia without *ad* *Delia floralis*
 —. Middle tibia with *ad* 10
10. Middle femur with some rather distinct *av*; hind tibia with strong apical *pd*
 *Delia robustiseta*
 —. Middle femur without distinct *av*; hind tibia with weak apical *pd* . . . *Delia cyclocerca*
11. Genal setae in two rows, in male 3rd sternite with a few slender setae *Delia echinata*
 —. Genal setae in a row, in male 3rd sternite with numerous slender setae
 *Delia coronariae*

64. *Delia expansa* sp. nov.

S.J.SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Description

Male: General coloration dark bluish brown. Head 1.2-1.3 times as high as long in profile; frons much broad, a little narrower than one-third head-width; parafacialia and cheek blue greyish pruinose, with rufous reflections when view in profile, interfrontalia blackish on upper half, dark brownish on another half; profrons much narrower than A3-width antenna black, A3 about 1.7 times as long as wide, with arista pubescent, the longest hair as long as basal diameter of arista.

Thorax brown greyish pollinose; mesonotum especially brownish tinged, with dark median and sublateral vitta; legs wholly blackish and faintly greyish pollinose.

Wing hyaline; m-m hardly sinuate; calyptra and knob of halter yellow.

Chaetotaxy: Frons: 2 *ori*, 3 *ors*, 1 *if*; mesonotum: 3 *pre acr*, a few accessory setulae between the rows; scutellum haired on ventral surface; secondary *ph* indistinguishable from accessory setulae; *pra* about half as long as anterior *ntpl*; mesopleuron: 1 strong and 4 fine *pstg*; *stpl* 1: 2; *t1*: 1 *ad*, 1 *pd*, distinct apical *pv*; *t2*: 1 *ad*, 2 *pd*, 2 *pv*; *t3*: 6 *ad*, 2 *av*, 3 *pd*, about 10 short *pv*, no apical *pv*.

Genitalia: Cercal plate well developed and suboval, truncate basad; surstylus nearly straight, with numerous fine setulae, in profile slightly curved forwards; 5th sternite with a few setae on outer margin of each process; preparamere conical, armed with 3 setae on upper and posterior margin; postparamere with 1 seta on lower posterior margin; basiphallus rectangular, distiphallus slender with apex bifurcate in lateral view.

Length: Body 4.8 mm, wing 4.1 mm.

Female: Unknown.

Type-examined: Holotype male, Mt. Sŏlaksan, GW, C. Korea, 29, VII, 1982, coll. Y.J. Kwon.

Host: Unknown.

Remark: This new species may be distinguished from the other related species by strikingly broad frons and the male genitalic characteristics.

65. *Delia hystricosternita* Hsue, 1981

Delia (Chortophilina) hystricosternita Hsue, 1981, Act. ent. Sin. 24: 213.

Delia hystricosternita; Suwa, 1983b, Nat. & Lif. 13(2): 35-37^{①-②}.

Type-locality: China (Manchuria).

Locality: GB : Mt. P'algongsan.

GW : Mt. Odaesan (Odae-san^②), Mt. Sŏlaksan (=Seolag-san^①).

Distribution: Korea, China (Manchuria).

Host: Unknown.

66. *Delia longithecra* Suwa, 1974

Delia longithecra Suwa, 1974, Ins. Mats. n.s. 4: 160-162.

Delia longithecra: Suwa, 1981a, Kontyû 49(1): 102-103^①.

Delia longithecra: Suwa, 1983b, Nat. & Lif. 13(2): 37^{②-⑤}.

Type-locality: Japan.

Locality: GB : Mt. Sobaeksan.

GN : Mt. Chirisan (=Jiri-san^⑤), Mt. Kayasan (=Kaya-san^④).

GW : Mt. Obongsan, Mt. Odaesan (=Odae-san^③), Mt. Sölaksan (=Seolag-san^②).

JJ : Mt. Hallasan (=Ryuzinkaku, Mt. Hanna^①).

Distribution: Korea, Japan (whole), U.S.S.R. (Kuriles).

Host: Unknown.

67. *Delia tenuiventris* (Zetterstedt, 1860)

Aricia tenuiventris Zetterstedt, 1860, Dipt. Scand. 14: 6205.

Hylemyia angustitarsis Malloch, 1920, Ohio Journ. Sci. 20: 277.

Hylemyia (Leptohylemyia) conversata Tiensuu, 1935, Act. Soc. Faun. Flor. Fenn. 58: 23-24

Delia angustitarsis (nec Malloch): Hennig, 1974, Flieg. pal. Reg. 63a: 733-735, pls. 86(911), 99(1095).

Delia conversata (nec Tiensuu): Suwa, 1974, Ins. Mats. n.s. 4: 162-163.

Delia tenuiventris: Michelsen, 1985, Steenstrupia 11(2): 58.

Type-locality: Sweden.

Description

Male: General coloration dark brownish grey, with tinged bluish faintly. Head 1.3-1.4 times as high as long in profile; frons a little narrower than diameter of anterior ocellus; parafacialia and cheek subshining, dull greyish pruinose; interfrontalia linear caudad; antenna brownish black to black, A3 1.9-2.0 times as long as wide, with arista pubescent of which the longest hair about 1.5-2 times as long as basal diameter of arista.

Thorax blue greyish pollinose; mesonotum somewhat brownish tinged; legs black.

Wing tinged with brown; m-m nearly straight; calyptra whitish or tinged with yellow; knob of halter yellowish.

Abdomen pale greyish pollinose, more or less tinged with brown or yellow, with distinct median vitta and fore marginal bands.

Chaetotaxy: Frons 5 *ori*, 1 *if*; mesonotum: some *pre acr*, of which a few are strong irregularly paired, the rows being much closer together than to *dc* and often nearly convergent each other; *pra* shorter than posterior *ntpl*; t1 1 *pv*, strong apical *pv* blunt apically and curved upwards; t2: 1 *pd*, 2 *pv*, no *ad*; t3: 3-5 *ad*, 1-2 *av*, 3 *pd*, 1-3 *pv*; middle metatarsus: some dorsal setulae more or less longer than accessory setulae.

Genitalia: Cercal plate subtriangular, with apex truncate; surstylus slender, bearing numerous setae on inner apical margin, in lateral aspect nearly straight and slightly concave on posterior apical margin; preparamere conical shaped, with 1 seta; postparamere gently tapered to apex and bearing 1 seta; epiphallus slender and membranous, distiphallus slender with upper margin hardened and serrated.

Length: Body 4.3-5.4 mm, wing 3.8-4.9 mm.

Female: Thorax and abdomen pale yellow greyish pollinose; abdomen without any prominent

S.J.SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

markings; t1: 1 *ad*, 1 *pd*, 1-2 *pv*; t2: 1 *ad*, 1 *av*, 2 *pd*, 2 *pv*; t3: 4-5 *ad*, 2-3 *av*, 2-4 *pd*, no *pv*.

Length: Body 4.6-5.7 mm, wing 4.2-5.2 mm.

Locality: GN : Mt. Chirisan.

Distribution: Korea (new record), Japan (Hokkaido, Honshu), U.S.S.R. (Kamchatka), Scandinavia.

Host: Unknown.

68. *Delia tumidula* Ringdahl, 1949

Delia tumidula Ringdahl, 1949, Opusc. Ent. 14: 52.

Delia tumidula: Suwa, 1983b, Nat. & Lif. 13(2): 37-38^①.

Type-locality: Sweden.

Locality: GW : Mt. Odaesan (=Odae-san^①).

Distribution: Korea, Europe.

Host: Unknown.

69. *Delia platura* (Meigen, 1826)z

Anthomyia platura Meigen, 1826, Syst. Besch. 5: 171.

Anthomyia diversa Wiedemann, 1830, Auss. Zweifl. Ins. 2: 436.

Anthomyia cana Macquart, 1835, Suit. Buff. 2: 340.

Aricia fusciceps Zetterstedt, 1845, Dipt. Scand. 4: 1552.

Anthomyia tyana + *A. sergia* + *A. tinia* + *A. perrima* + *A. viana* + *A. corelia* + *Eriphua marginata* + *Dialyta cupreifrons* Walker, 1849, List Dipt. Brit. Mus. 4: 945-953, 964, 966.

Hylemyia deceptiva + *H. similis* Fitch, 1856, Trans. N.Y. Agr. Soc. 15: 533.

Chortophila cilicrura Rondani, 1866, Att. Soc. Nat. Mil. 9: 165.

Anthomyia platygaster + *A. lanicrus* Thomson, 1869, Eug. Kes., Dipt.: 556.

Anthomyia zeas Riley, 1866, 1st Ann. Rept. Nox. Ben. Ins. Miss.: 155.

Anthomyia funesta Kuhn, 1870, Zeitschr. landw. Centr. Prov. Sachs. 6: 3.

Anthomyia zae Riley, 1881, Nin. Rep. Ins. Miss.: 89.

Chortophila spinipes + *C. rubifrons* + *Homalomyia rupecula* + *Anthomyia sanctijacobi* Bigot, 1885, Ann. Soc. Ent. Franc. 6(4): 279, 285, 296.

Homalomyia rava + *Phorbia nova-zelandiae* Hutton, 1900, Trans. N. Zeal. Inst. 33: 74, 76.

Phorbia platura: Coquillett, 1901, Psych., Camb., Mass. 9: 150.

Hylemyia (Chortophila) cilicrura (nec Rondani): Seguy, 1923, Faun. Franc. 6: 122.

Hylemyia (Delia) fusciceps (nec Zetterstedt): Ringdahl, 1933, Ent. Tidsk. 54: 24.

Hylemyia platura: Hennig, 1938, Ent. Berl.-Dahl. 5: 282.

Delia platura: Ringdahl, 1959, Svensk Ins. 11, Musc. 3: 283.

Hylemyia platura: Kim, 1961, List Ins. Mt. Jiri (1): 27^①.

Hylemyia platura: Lee, 1963, Ins. Pests Agr. Crops: 129-131 (Korea).

Hylemyia (Delia) cana (nec Macquart): Fan, 1965, Keys comm. flies Chin.: 51^①.

Anthomyia brassicae (sic, nec Wiedemann): Zool. Soc. Kor., 1968, Nom. An. Kor.: 184.

Delia platura: Suwa, 1981a, Kontyû 49(1): 103⁽²⁾⁻⁽³⁾.

Delia platura: Sun et Zhang, 1982, Ins. Xiz. II: 206 (Korea).

Type-locality: Europe.

Locality: CN : Mt. Tôksungsan.

GB : Ch'ilkok, Mt. Chuwangsan, Hayang Ŭp, Mt. Hwangaksan, Kamp'o, Koryŏng, Mt. Naeyŏnsan, Mt. P'algongsan (=Mt. Palkon⁽²⁾), Taegu, Tansan Myŏn, Is. Ullŭngdo.

GG : Is. Kangwhado, Mt. Myŏngsŏngsan, Mt. Soyosan.

GN : Ch'ilwŏn Myŏn, Mt. Chirisan⁽¹⁾, Mt. Ch'ŏnwhangsang, Ch'ungmu, Mt. Kaysan, Mt. Kŭmsan, Masan, Pangŏjin, Mt. Wŏnhyosan.

GW : Mt. Ch'iaksan, Mt. Obongsan, Mt. Odaesan, Mt. Sŏlaksan, Mt. Tutasan.

JB : Kyŏkp'o, Mt. Mayisan.

JJ : Cheju, Chungmun, Mt. Hallasan.

JN : Is. Chindo, Mt. Chogyesan, Mt. Chŏpto, Is. Hŭksando, Mt. Mudŭngsan, Mt. Turunsan, Is. Wando.

Distribution: Korea, Japan China, U.S.S.R. (Sachalin), Europe; Cosmopolitan.

Host: Cruciferous plant.

70. *Delia antiqua* (Meigen, 1826)

Anthomyia antiqua Meigen, 1826, Syst. Besch. 5: 166.

Musca (Anthomyia) liturariae Ratzeburg, 1844, Forstinsekten III: 170.

Phorbia cepetorum Meade, 1883, Ent. Mo. Mag. 19: 218.

Crinura antiqua: Schnabl & Dziedzicki, 1911, Nov. Act., Abh. Leop.-Carol. Akad. Nat. 95: 95-96.

Hylemyia antiqua: Seguy, 1923, Faun. Franc. 6: 90.

Hylemyia antiqua: Seedl. Stst. Hamg., 1928, Cult. Meth. Veg. (Hamgyŏngbukto).

Helemyia sp. (sic): Nakayama, 1936, Imp. Ins. Injur. Agr. Kor. 228-230⁽¹⁾⁻⁽⁴⁾.

Hylemyia antiqua: Katô, 1939, Bot. & Zool. 7: 1529 (Korea).

Hylemyia antiqua: Yokoo, 1940, Oyo-Dob.-Zassh. 12: 188 (Korea).

Hylemyia antiqua: Lee, 1963, Ins. Pests Agr. Crops: 133-135 (Korea).

Hylemyia antiqua: Paik, 1963, Agr. For. Ins. Pests (1970 ed.): 206-207 (Korea).

Hylemyia antiqua: Zool. Soc. Kor., 1968, Nom. An. Kor.; 184 (Korea).

Hylemyia antiqua: Kor. Soc. Pl. Prot., 1972, List. Pl. Dis., Ins. Pests, Weeds Kor.: 218 (Korea).

Delia antiqua: Hennig, 1974, Flieg. pal. Reg. 63a: 739-743, pls. 90 (1030), 108 (1159) (Korea).

Delia antiqua: Suwa, 1974, Ins. Mats. n.s. 4: 146 (Korea).

Delia antiqua: Suwa, 1981a, Kontyû 49(1): 102 (Korea).

Type-locality: Europe.

Locality: CN : Mt. Tôksungsan.

HB : Kyŏngsŏng⁽³⁾.

HN : Kapsan⁽¹⁾, P'ungsan⁽²⁾.

S.J.SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

- GB : Hayang Ŭp, Kamp'o, Mt. P'alongsan, Pian Myŏn, Taegu, Tansan Myŏn, Is. Ullŭngdo.
GG : Is. Kangwhado.
GN : Ch'ilwŏn Myŏn, Ch'ungmu, Kimhae, Mt. Kŭmsan, Pangŏjin, Pusan^④.
JB : Kyŏkp'o, Mt. Mayisan.
JJ : Cheju.
JN : Is. Chindo, Is. Wando.

Distribution: Korea, Japan (Hokkaido, Honshu, Kyushu), China (Manchuria), U.S.S.R. (Sachalin, Siberia), Europe, N. America; Holarctic; Brazil, Colombia.

Host: *Allium* spp.

71. *Delia floralis* (Fallen, 1824)

- Musca floralis* Fallen, 1824, Mon. Musc. Suec. 7: 71.
Anthomyia vacans Pandelle, 1900, Rev. Ent. Franc. 19, Musc.: 235.
Anthomyia flavopicta Matsumura, 1915, Dai-Nipp.-Gaich.-Zensh.: 55.
Hylemyia floralis: Seguy, 1923, Faun. Franc. 6:95-96.
Hylemyia crucifera Hockett, 1929, Can. Ent. 61:93.
Chortophila floralis: Tomaszewski, 1934, Arb. morph. tax. Ent. Berl.-Dahl. 1:60.
Hylemyia (Delia) floralis: Tiensuu, 1935, Act. Soc. Faun. Flor. Fenn. 58 (4): 21.
Hylemyia floralis: Seidl. Stat. Hamg., 1928, Cult. Meth. Veg.
Hylemyia floralis: Kye, 1929, Ann. Unit. Soc. Agr.
Anthomyia flavopicta (nec Matsumura): Nakayama, 1936, Imp. Ins. Inj. Agr. Kor.: 226-228^{①-②}.
Hylemyia floralis: Katô, 1939, Bot. & Zool.: 1368 (Korea).
Hylemyia floralis: Yokoo, 1940, Ôyô-Dôb.-Zassh. 12: 194 (Korea).
Hylemyia floralis: Shiraki, 1958, San. Ins.: 855 (Korea).
Delia floralis: Ringdahl, 1959, Svensk Ins. 11, Musc. 3: 280.
Hylemyia floralis: Lee, 1963, Ins. Pests Agr. Crops: 129 (Korea).
Hylemyia (Delia) floralis: Fan, 1965, Keys comm. flies Chin.: 46-48 (Northern Korea).
Hylemyia floralis: Zool. Soc. Kor., 1968, Nom. An. Kor.: 184 (Korea).
Hylemyia floralis: Kor. Soc. Pl. Prot., 1972, List Plant Dis., Ins. Pests, Weeds Kor.: 218 (Korea).
Delia floralis: Hennig, 1974, Flieg. pal. Reg. 63a: 816-819, pls. 87(1005), 105(1138) (Korea).
Delia floralis: Suwa, 1974, Ins. Mats. n.s. 4: 146-147 (Korea).
Delia floralis: Suwa, 1981a, Kontyû 49(1): 102 (Korea).

Type-locality: Sweden.

Locality: HB : Hamgyŏngbukto^①.
HN : Hamgyŏngnamdo^②.

Distribution: Korea, Japan (Hokkaido, Honshu), U.S.S.R. (Kamchatka, Kuriles, Sachalin), Europe; Holarctic region.

Host: Cruciferous plants.

72. *Delia robustiseta* Judin, 1974

Delia robustiseta Judin, 1974, Biol. Nauk. 17: 23-24.

Delia takizawai Suwa, 1974, Ins. Mats. n.s 4: 155-157.

Delia robustiseta: Kwon et Suh, 1982c, Kor. Journ. Plant Prot. 21(4): 188-189 ^①.

Delia takizawai koreana Suwa, 1983b, Nat. & Lif. 13(2): 38 ^②.

Delia takizawai: Suwa, 1984, Ins. Mats. n.s. 29: 39-57 (Korea).

Type-locality: U.S.S.R. (Siberia).

Locality: GG : Mt. Soyosan ^①.

GW : Mt. Obongsan, Mt. Odaesan (=Odae-san ^②).

Distribution: Korea, Japan (Hokkaido, Honshu, Kyushu), U.S.S.R. (Kuriles, Siberia).

Host: Unknown.

73. *Delia cyclocerca* Hsue, 1981

Delia cyclocerca Hsue, 1981, Act. ent. Sin. 24: 215.

Delia cyclocerca: Suwa, 1983b, Nat. & Lif. 13(2): 32-34 ^①.

Type-locality: China (Manchuria).

Locality: GN : Mt. Chirisan (=Jiri-san ^①).

GW : Mt. Sölaksan.

Distribution: Korea, China (Manchuria).

Host: Unknown.

74. *Delia echinata* (Seguy, 1923)

Chortophila echinata Seguy, 1923, Ann. Soc. Ent. Franc. 91: 360.

Hylemyia scanica Ringdahl, 1926, Ent. Tidskr. 47: 118.

Hylemyia (Delia) echinata: Tiensuu, 1935, Act. Soc. Faun. Flor. Fenn. 58(4): 24.

Hylemyia abenda Hall, 1937, Proc. U.S. Nat. Mus. 84: 201.

Delia scanica (nec Ringdahl): Ringdahl, 1959, Svensk Ins. II, Musc. 3: 285.

Delia echinata: Hennig, 1974, Flieg, pal Reg. 63a: 796, pls. 88(1007), 94(1174).

Delia echinata: Kwon et Suh, 1982a, Kor. Journ. Plant Prot. 21(2): 100 ^{①-③}.

Delia echinata: Suwa, 1983b, Nat. & Lif. 13(2): 34 ^{④-⑦}.

Type-locality: France.

Locality: CN : Mt. Toksungsan.

GB : Koryong, Mt. P'algongsan (=Mt. Palgongsan ^②), Mt. Sobaeksan, Taegu (=Daegu ^③).

GG : Is. Kangwhado, Mt. Myōngsōngsan, Mt. Soyosan.

GN : Ch'ilwōn Myōn, Mt. Chirisan (=Mt. Jirisan ^①, Jiri-san ^⑦), Mt. Kūmsan.

GW : Mt. Obongsan, Mt. Odaesan (=Odae-san ^⑥), Mt. Sölaksan (=Seolag-san ^④, Seolag-dong ^⑤).

JJ : Mt. Hallasan.

S.J.SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Distribution: Korea, Japan (whole), U.S.S.R. (Sachalin), India, Europe, N. America.

Host: *Dianthus caryophyllus*, *Spinacia oleacea*, *Stellaria media*.

75. *Delia coronariae* (Hendel, 1925)

Chortophila coronariae Hendel, 1925, Konowia 4: 305.

Hylemyia (Delia) striatula Karl, 1943, Stett. Ent. Zeitg. 104: 71.

Hylemyia (Delia) nudiventris Ringdahl, 1948, Opusc. Ent. 13: 164.

Delia paludosa Fonseca, 1966, Ent. Mo. Mag. 101: 276.

Delia coronariae: Hennig, 1974, Flieg. pal. Reg. 63a: 778-781, pls. 88(1009-1011), 98 (1088), 99(1173, 1175).

Type-locality: Germany.

Description

Male: General coloration dark brownish grey. Head 1.2-1.3 times as high as long in profile; frons about as wide as or slightly wider than diameter of anterior ocellus; parafacialia and cheek bluish grey pruinose, in lateral view duller and blackish; interfrontalia reddish brown; antenna black, A3 1.7-1.8 times as long as wide; with arista shortly pubescent of which the longest hair about equal to basal diameter of arista; palpus and haustellum black.

Thorax densely brownish grey pollinose, especially deeper on dorsum; mesonotum with rather distinct median and sublateral vittae; legs black.

Wing faintly yellow tinged; m-m hardly sinuate; calyptra and halter brownish.

Abdomen brownish black, some bluish tinged and with dark median vitta.

Chaetotaxy: Frons: 3-5 *ori*, 1 *if*; mesonotum: 3 *pre acr*, lacking accessory setulae between the rows; secondary *ph* fine, usually indistinguishable from accessory setulae; *pra* about half as long as anterior *ntpl*; 3rd sternite with numerous slender setae; t1: 1 *ad*, 1 *pv*, short apical *pv*; t2: 1 *ad*, 1 *pd*, 2 *pv*; t3: 4 *ad*, 2 *av*, 3 *pd*, 0-3 fine *pv*, no apical *pv*.

Genitalia: Cercal plate rather cordate; surstylus simply slender, with numerous fine setulae, in lateral view slightly curved forwards; preparamere armed with 2 setae; postparamere concave on posterior margin; basiphallus rectangular, epiphallus somewhat stout and membranous; distiphallus very slender.

Length: Body 4.2-4.6 mm, wing 3.1-3.8 mm.

Female: Unknown.

Locality: GB : Mt. Chuwangsan, Mt. P'algongsan, Taegu.

GN : Mt. Wŏnhyosan.

Distribution: Korea (new record), China (Manchuria), Europe.

Host: Unknown.

Genus 22. *Phorbia* Robineau-Desvoidy, 1830

Phorbia Robineau-Desvoidy, 1830, Ess. Myod.: 559.

Type-species: *Phorbia musca* Robineau-Desvoidy, 1830

Type-locality: France.

Chortophila Macquart, 1835, Suit. Buff. 2: 323.

Type-species: *Anthomyia sepia* Meigen, 1826

Type-locality: Europe.

Key to species of *Phorbia*

1. Parafrontalia without *ors* in male 2
 —. Parafrontalia with *ors* in male 3
2. Fore tibia with *ad*; middle femur with strong *av* *Phorbia soyosana* sp. nov.
 —. Fore tibia without *ad*; middle femur without strong *av* *Phorbia odaesana*
3. Fore tibia with *pd* and without *ad* 4
 —. Fore tibia with *ad* and without *pd* 5
4. Middle tibia with *pv*; *pra* longer than anterior *ntpl* *Phorbia longipilis*
 —. Middle tibia without *pv*; *pra* as long as anterior *ntpl* *Phorbia dissimilis* sp. nov.
5. Middle tibia with *av*; *pra* about as long as anterior *ntpl* *Phorbia fascicularis*
 —. Middle tibia without *av*; *pra* longer than anterior *ntpl* *Phorbia taeguensis* sp. nov.

76. *Phorbia soyosana* sp. nov.

Description

Male: General coloration purplish black with greyish pollinose. Head 1.1-1.2 times as high as long in profile; frons more or less wider than anterior ocellus; parafrontalia narrowly separated from each other; parafacialia and cheek silvery greyish pruinose; profrons 1.5 times as wide as A3-width; antenna with arista minutely pubescent, A3 1.8 times as long as wide.

Thorax greyish pollinose, partially tinged with brown, especially along rows of *dc* on mesonotum; legs wholly black.

Wing tinged with brown, rather strongly at base; calyptra whitish, slightly yellowish marginally; knob of halter dull yellow.

Abdomen densely brown greyish pollinose, with broad dark median vitta.

Chaetotaxy: Frons 8 *ori*, 1 *if*; mesonotum: 4 *pre acr*; secondary *ph* about as long as primary one; *pra* equal to length of anterior *ntpl*; *stpl* 1: 3; the posterior lowest much finer than the others: t1: 1 *ad*, 1 *pv*; f2: 3 strong *av* on basal third; t2: 1 *ad*, 2 *pd*, 2 *pv*; t3: 3 *ad*, 2 *av*, 2 *pd*, 2 fine *pv*.

Genitalia: Cercal plate subtriangular; surstylus straight and convergent each other, with short setulae on subapex, in lateral view nearly straight and slightly broadened at middle portion; 5th sternite with processes rather parallel to each other and roundly protrudent on middle margin which bearing numerous short setulae; preparamere largely developed, furnish with 2 setae; postparamere small and oblong; epiphallus degenerated, basiphallus somewhat rectangular, distiphallus slender.

Length: Body 4.7 mm, wing 4.1 mm.

Female: Unknown.

Type-examined: Holotype male, Mt. Soyosan, GG, C. Korea, 15, V, 1982, coll. Y.J. Kwon.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Host: Unknown.

Remark: This new species resembles *Phorbia asiatica* Hsue, 1981 in external feature, but distinctly separated from it by the male genitalic characteristics.

77. *Phorbia odaeana* Suwa, 1983

Phorbia odaeana Suwa, 1983b, Nat. & Lif. 13(2): 40-42^①.

Type-locality: Korea.

Locality: GW : Mt. Odaesan (=Odae-san^①).

Distribution: Korea.

Host: Unknown.

78. *Phorbia longipilis* (Pandelle, 1900)

Anthomyia (*Chortophila*) *longipilis* Pandelle, 1900, Rev. Ent. Franc. 19, Musc.: 261.

Chortophila (*Adia*) *pseudopenicillaris* Kramer, 1917, Abh. nat. Ges. Gorl. 28: 306.

Chortophila (s. str.) *longipilis*: Seguy, 1923, Faun. Franc. 6: 129.

Hylemyia (*Phorbia*) *greisescens* Ringdahl, 1933, Ent. Tidskr. 54: 18.

Phorbia longipilis: Hennig, 1969, Flieg. pal. Reg. 63a: 309-310, pls. 28(397), 30(415), 33(445).

Type-locality: Germany.

Description

Male: General coloration black, with dark brown greyish pollinose. Head 1.2-1.3 times as high as long in profile; frons about as wide as distance between posterior ocelli exclusive; interfrontalia linear caudad; parafacialia and cheek white greyish pruinose; profrons 1.5 times as wide as A3-width; antenna black, A3 about 1.5 times as long as wide, with arista minutely pubescent; haustellar mentum shining black.

Thorax purple greyish pollinose and somewhat brownish tinged; mesonotum with rather distinct median and sublateral vittae; legs black.

Wing sparsely brownish tinged; m-m straight; calyptra pale yellow; knob of halter reddish yellow.

Abdomen strongly swollen on caudal half, club-shaped in profile.

Chaetotaxy: Frons 5 *ori*, 1 rather distinct *ors*, 1 fine *if*; mesonotum: 3 slender *pre acr*; secondary *ph* half as long as primary one; *pra* longer than anterior *ntpl*; *stpl* 1: 3; the posterior lowest one weaker than the others. t1: 1 *pd*, 3 *pv*; t2: 2 *ad*, 2 *av*, 3 *pd*, 3 *pv*; t3: 5 *ad*, 4 *av*, 4 *pd*, 4 *pv*, no apical *pv*.

Genitalia: Cercal plate subsagittate; surstylus slender and slightly sinuate, with a few setulae at inner middle margin, in profile roundly rounded at posterior middle margin; 5th sternite with a tuft of short setulae at inner middle margin of each process; preparamere somewhat rectangular, with a process at posterior lower margin; postparamere small and oblong; epiphallus small conical and nearly degenerated, distiphallus slender.

Length: Body 4.9 mm, wing 4.3 mm.

Female: Unknown to me.

Locality: GB : Taegu.

Distribution: Korea (new record), Europe.

Host: Unknown.

79. *Phorbia dissimilis* sp. nov.

Description

Male: General coloration black with blue greyish pollinose. Head a little higher than long in profile; frons twice as wide as diameter of anterior ocellus; parafrontalia distinctly separated from each other; parafacialia and cheek silvery pruinose and lustrous; profrons a little or rather much wider than A3-width; antenna fuscous and minutely pubescent, with A3 about 1.6-2.0 times as long as wide; palpus blackish; haustellum dark brownish, with mentum faintly greyish pollinose.

Thorax blue greyish pollinose, which is tinged with brown; mesonotum with obscure brownish median and lateral vittae; legs black.

Wing faintly brownish tinged, denser at base; m-m nearly straight; calyptra yellowish; knob of halter deep brownish to dark brownish.

Abdomen strongly swollen on caudal half, club-shaped in profile.

Chaetotaxy: Frons: 6 *ori*, 1 minute *ors*, 1 short *if*; mesonotum: 3 slender *pre acr*; secondary *ph* weak; *pra* about as long as anterior *ntpl*; mesopleuron: some accessory *pstg*; *stpl* 1: 2; *t1*: 1 *pd*, 2 *pv*; *f2*: 5 strong *av*, a row of *pv* which are much longer than the femur-height; *t2*: 1 *ad*, 2 *av*, 1 strong *pd*; *t3*: 5 *ad*, 3-4 *av*, 3 *pd*, 2-4 *pd*, no apical *pv*.

Genitalia: Cercal plate somewhat pentagonal, with 1 long seta at apex; surstylus slender and slightly sinuate, in profile nearly straight; 5th sternite with a tuft of short setulae at inner middle margin of each process; preparamere with a process at lower posterior margin and 2 strong setae; postparamere subtriangular; epiphallus slender and slightly curved backwards, distiphallus slender.

Length: Body 4.8-5.5 mm, wing 4.1-4.9 mm.

Female: Unknown.

Type-examined: Holotype male, Taegu, GB, S. Korea, 26, III, 1982, coll. Y.J. Kwon; paratype: 1 male, Masan, GN, S. Korea, 25, III, 1984, coll. Y.J. Kwon.

Host: Unknown.

Remark: This new species resembles *Phorbia longipilis* (Pandelle, 1900) and *P. asiatica* Hsue, 1981, but is separated well from them by the male genitalic characteristics.

80. *Phorbia fascicularis* Tiensuu, 1935

Phorbia fascicularis Tiensuu, 1935, Act. Soc. Faun. Flor. Fenn. 58(4): 15.

Phorbia fascicularis: Suwa, 1983b, Nat. & Lif. 13(2): 40⁽¹⁾.

S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

Type-locality: Finland.

Locality: GW : Mt. Odaesan (=Odae-san^①).

Distribution: Korea, Japan (Honshu), Europe.

Host: Unknown.

81. *Phorbia taeguensis* sp. nov.

Description

Male: General coloration black, brown greyish pollinose. Head 1.2-1.3 times as high as long in profile; frons rather wider than distance between posterior ocelli exclusive; parafrontalia distinctly separated from each other; parafacialia and cheek silvery pruinose; profrons 1.4-1.5 times as wide as A3-width; antenna black, with arista shortly pubescent, A3 about 1.7-2.0 times as long as wide; palpus black; haustellum dark brownish, with mentum shining.

Thorax blue greyish pollinose, partially dark brownish tinged; mesonotum with distinct dark brown median and sublateral vittae; legs black.

Wing blackish tinged, denser at base; m-m nearly straight; calyptera yellowish, knob of halter dark brown.

Abdomen blue greyish pollinose, strongly swollen on caudal half, club-shaped in profile.

Chaetotaxy: Frons: 5-6 *ori*, 1 distinct *ors*, 1 prominent *if*; mesonotum: 3 *pre acr*; primary *ph* about 1.5 times as long as secondary one; *pra* long than anterior *ntpl*; *stpl* 1: 3, the posterior lowest one weaker than the others; t1: 1 strong *ad*, 1 *pv*; f2: a row of *pv* which are much longer than the femur-height; t2: 1-2 *ad*, 2 *pd*, 2 *pv*; t3: 4-5 *ad*, 3 *av*, 3-5 *pd*, 0-4 fine *pv*, no apical *pv*; wing with strong costal thorns.

Genitalia: Cercal plate rather cordate, with 1 long seta at apex; surstylus slender and slightly sinuate, with a few setulae at inner subbasal margin; 5th sternite with a tuft of short setulae at inner subapical margin of each process; preparamere with a process on lower posterior margin, furnish with 3 setae; postparamere conical, bearing 1 fine setae; epiphallus rod-shaped, distiphallus slender.

Length: Body 4.3-5.4 mm, wing 3.8-4.9 mm.

Female: Frons 0.38-0.4 times as wide as head-width, with 4 *ori*, 3 *ors* and 1 *if*; abdomen with compressed terminal segment.

Length: Body 4.4-5.6 mm, wing 3.7-5.1 mm.

Type-examined: Holotype male, Taegu, GB. S. Korea, 18, III, 1984, coll. Y.J. Kwon; paratypes: 20 males and 3 females, the same data as holotype; 12 males and 4 females, 26, III, 1984, the same locality as holotype; 1 male, the same locality and collector as holotype.

Remark: This new species may be separated from the other related species by the male genital characteristics.

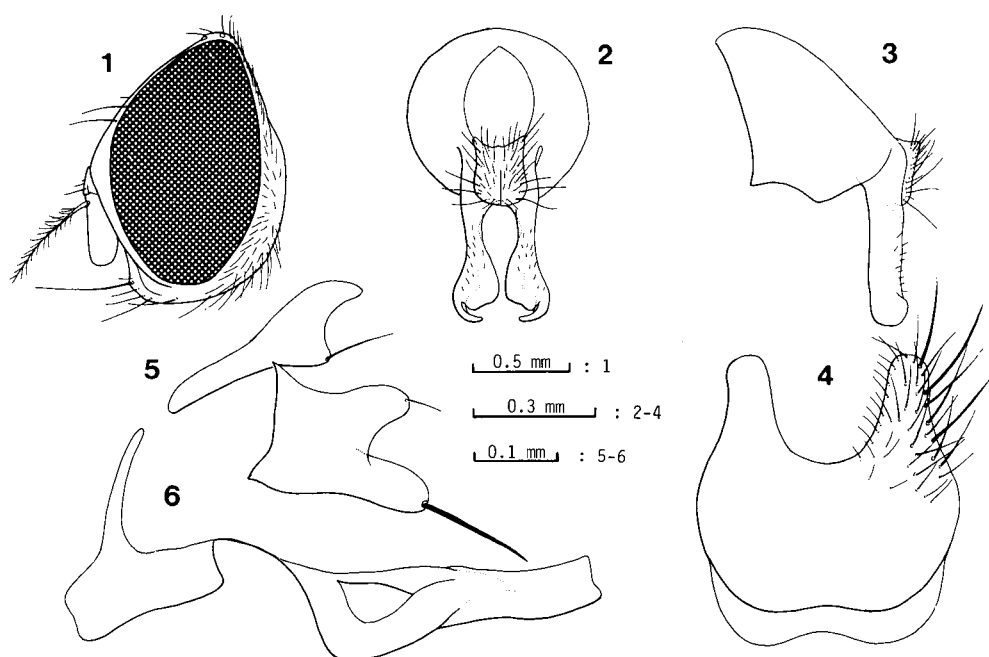


Fig. 1. *Parapegomyia schineri* (Schnabl, 1910), male. 1: head, lateral view; 2: hypopygium, dorsal view; 3: ditto, lateral view; 4: 5th sternite, ventral view; 5: paramere, lateral view; 6: aedeagus, lateral view.

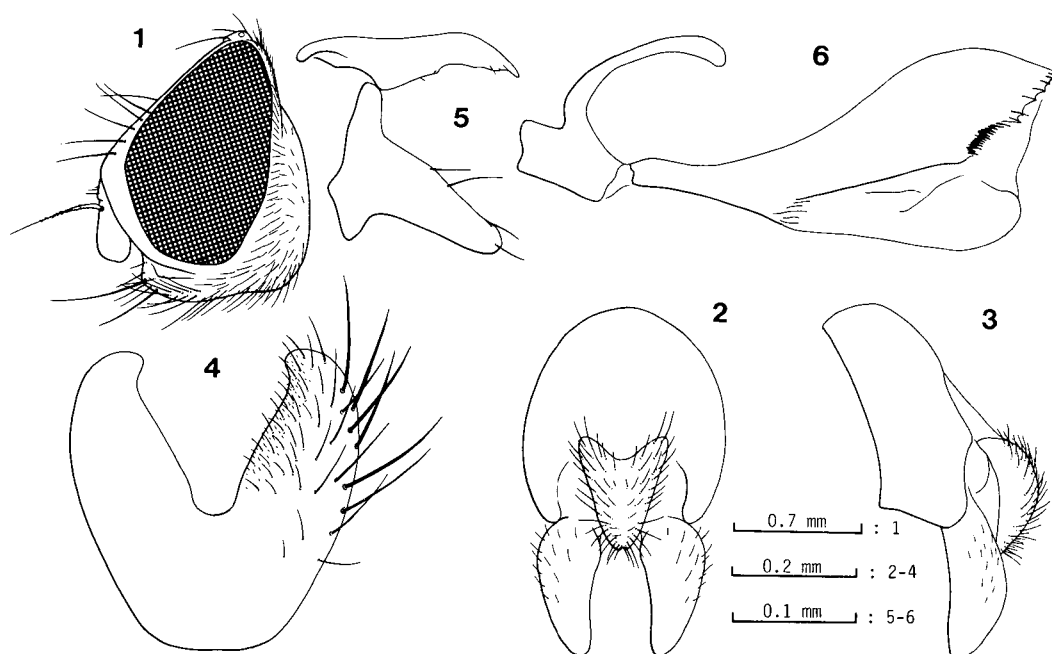


Fig. 2. *Nupedia debilis* (Stein, 1916). For caption, see fig. 1.

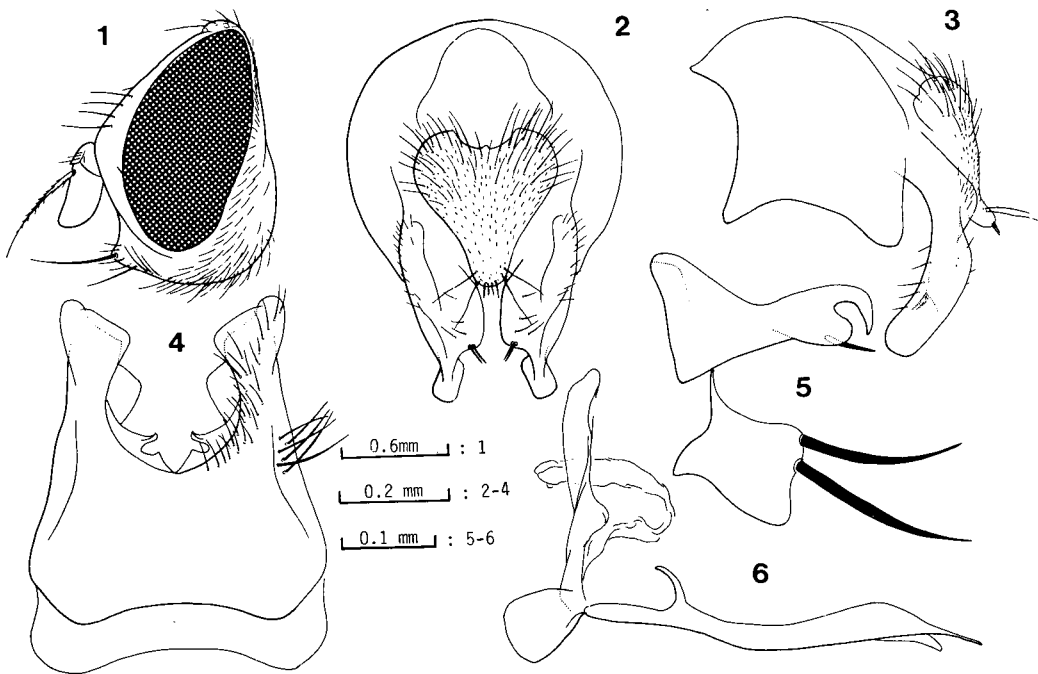


Fig. 3. *Anthomyia koreana* sp. nov.

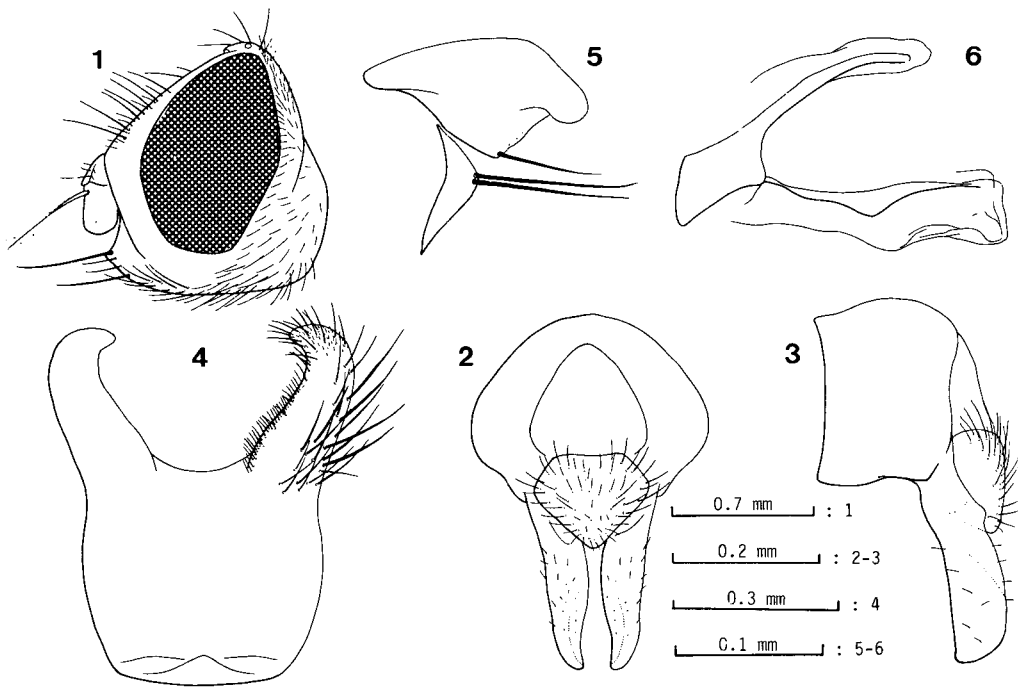


Fig. 4. *Botanophila striolata* (Fallen, 1824).

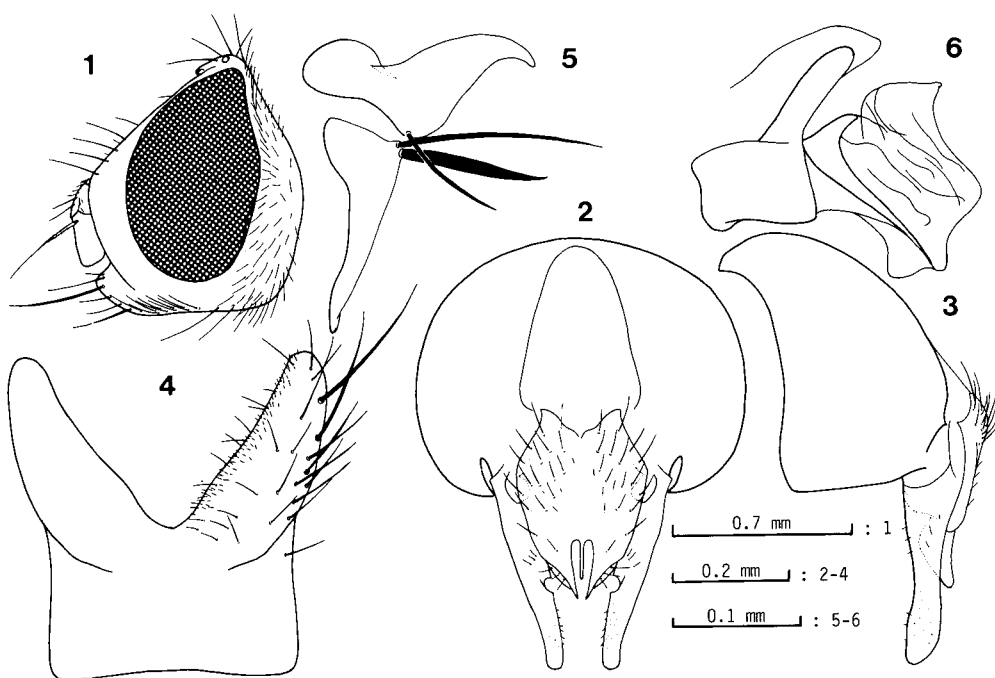


Fig. 5. *Botanophila seungmoi* sp. nov.

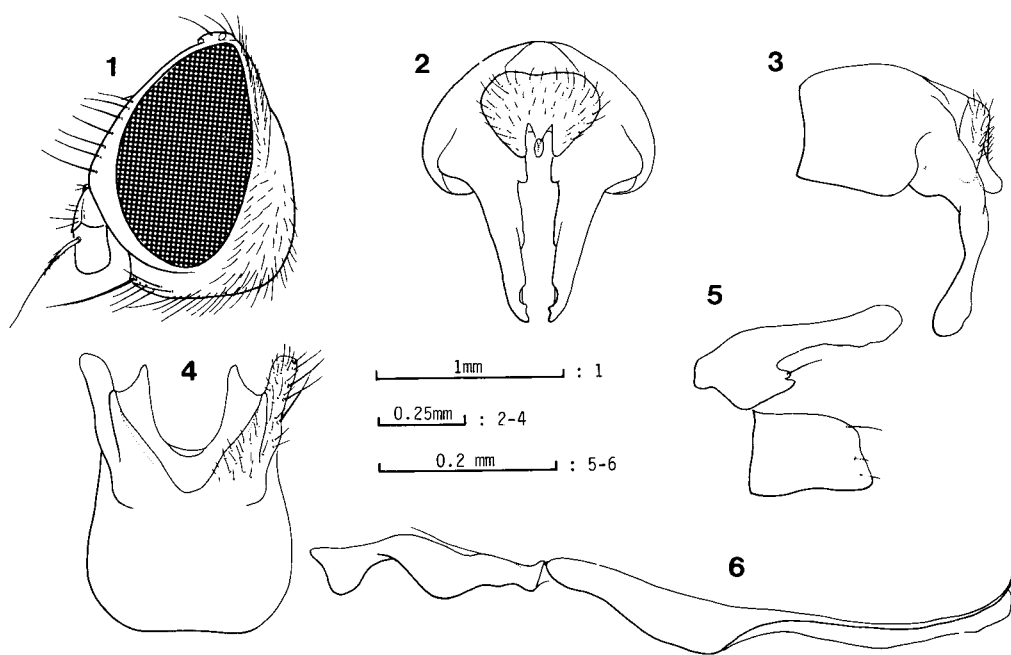


Fig. 6. *Acklandia koreacola* sp. nov.

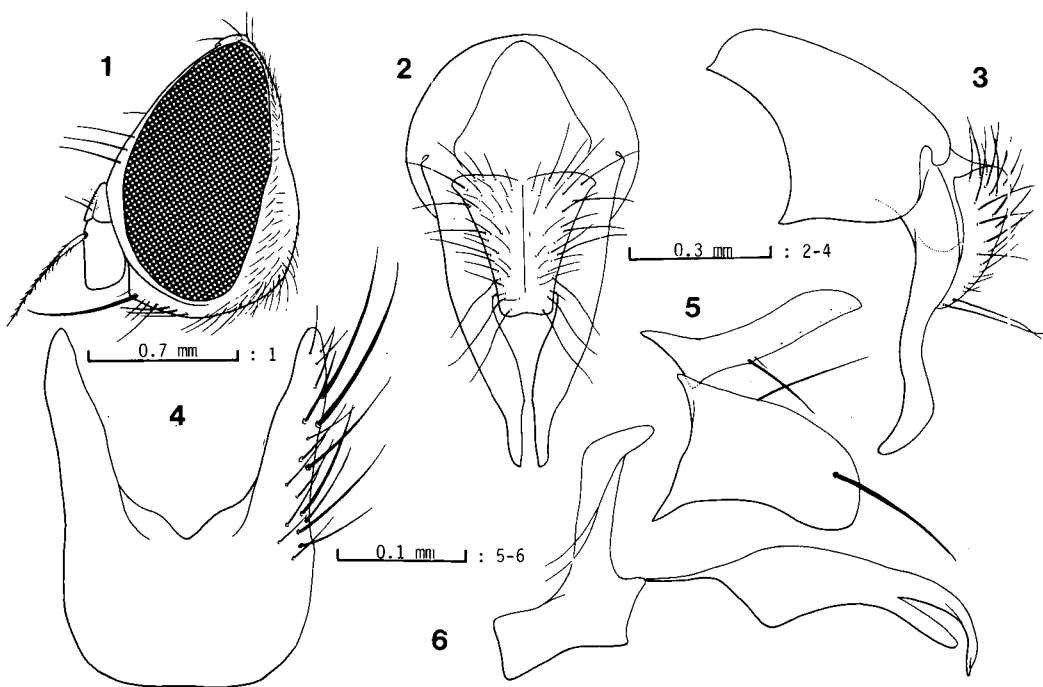


Fig. 7. *Lasiomma monticola* sp. nov.

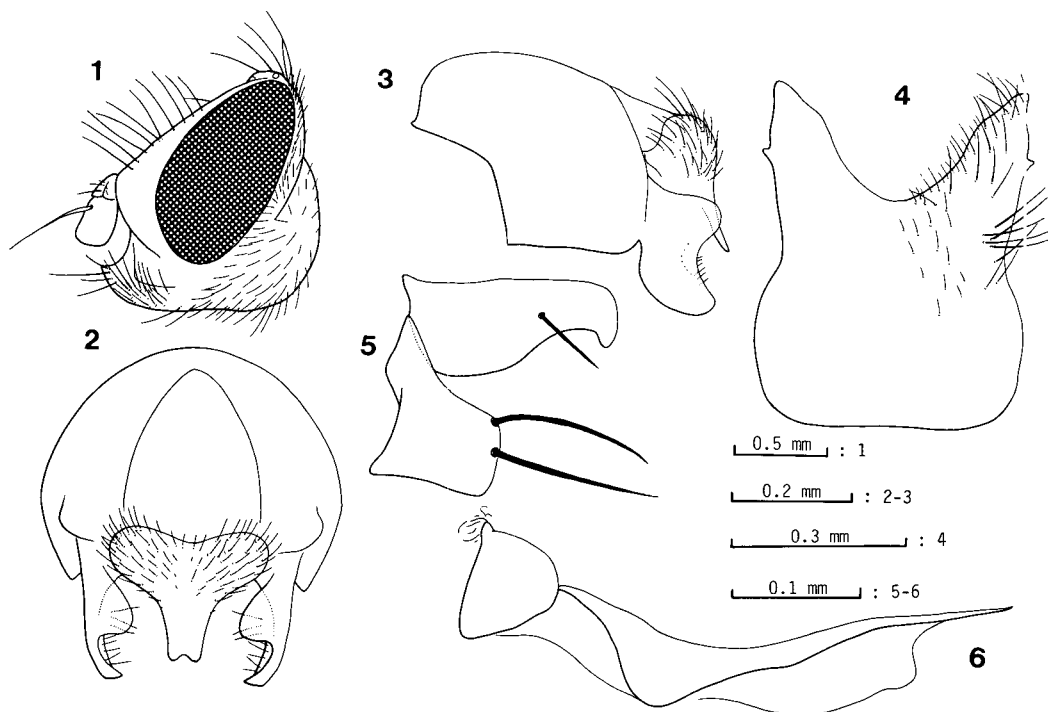


Fig. 8. *Egle muscaria* (Fabricius, 1777).

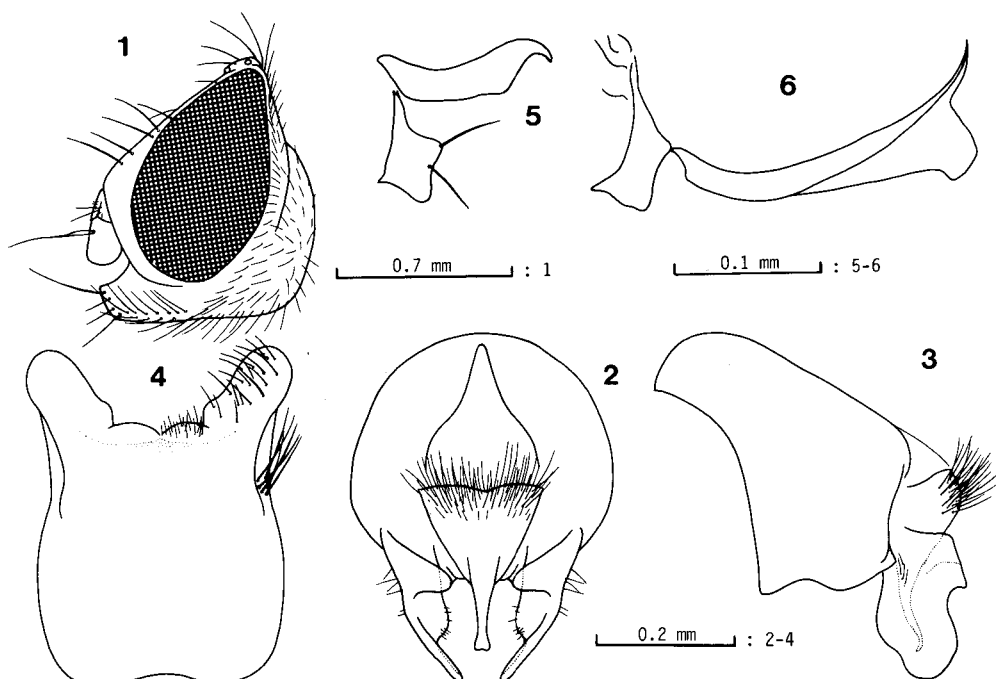


Fig. 9. *Egle longipalpis* Malloch, 1924.

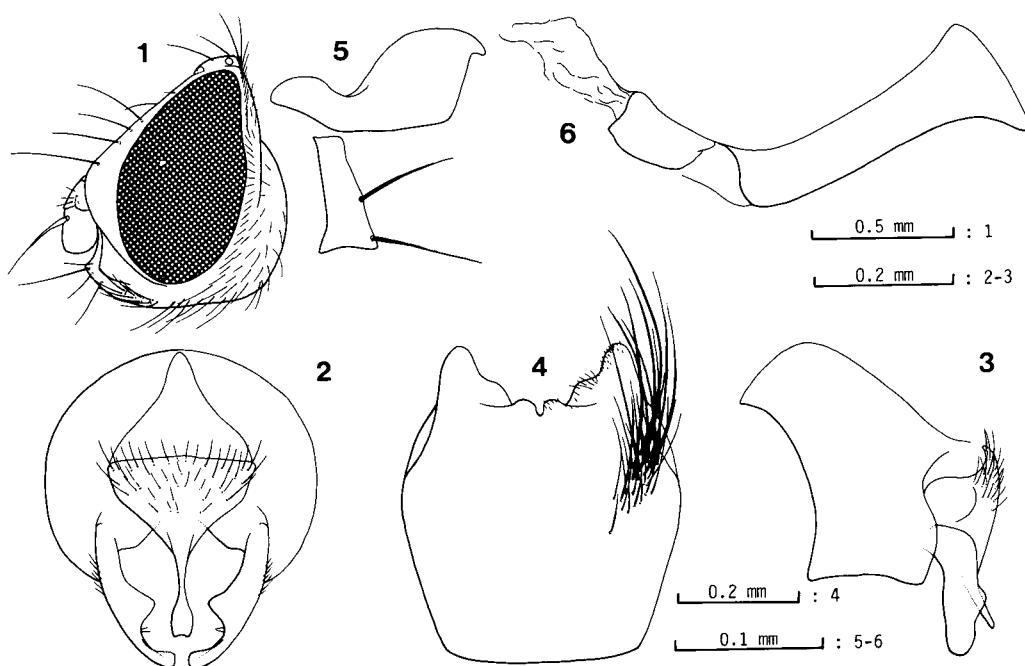


Fig. 10. *Egle parvaeformis* Schnabl, 1911.

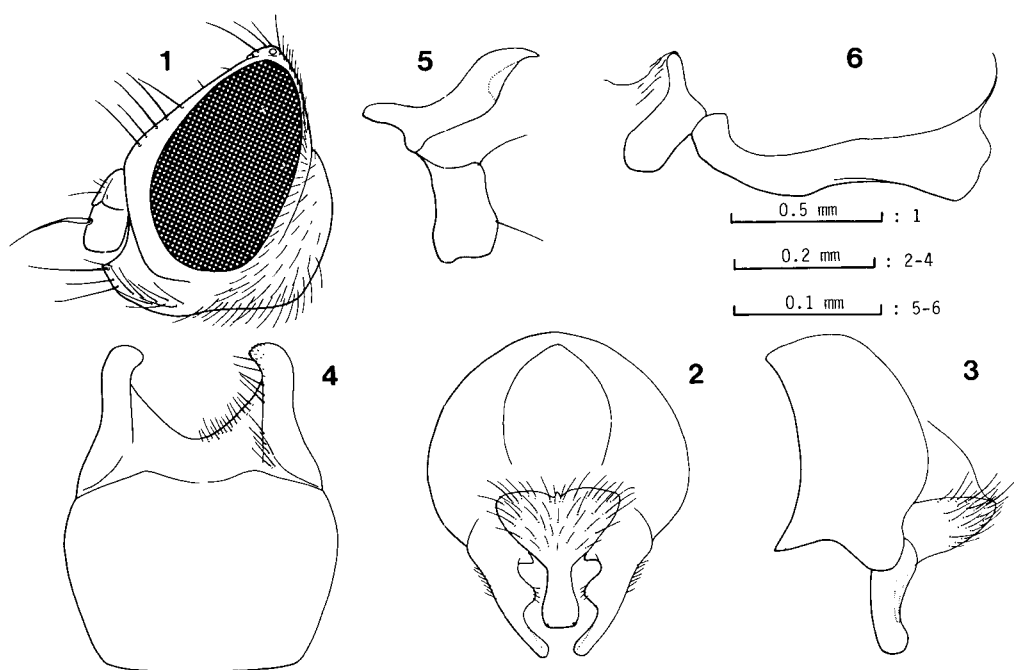


Fig. 11. *Egle parva* Robineau-Desvoidy.

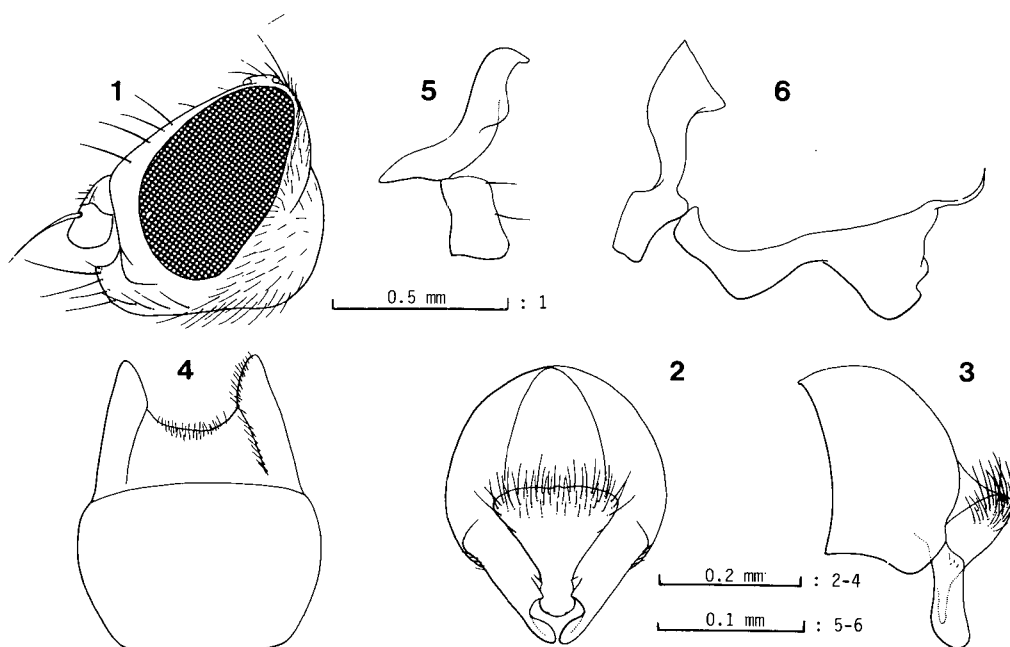


Fig. 12. *Egle podulparia* sp. nov.

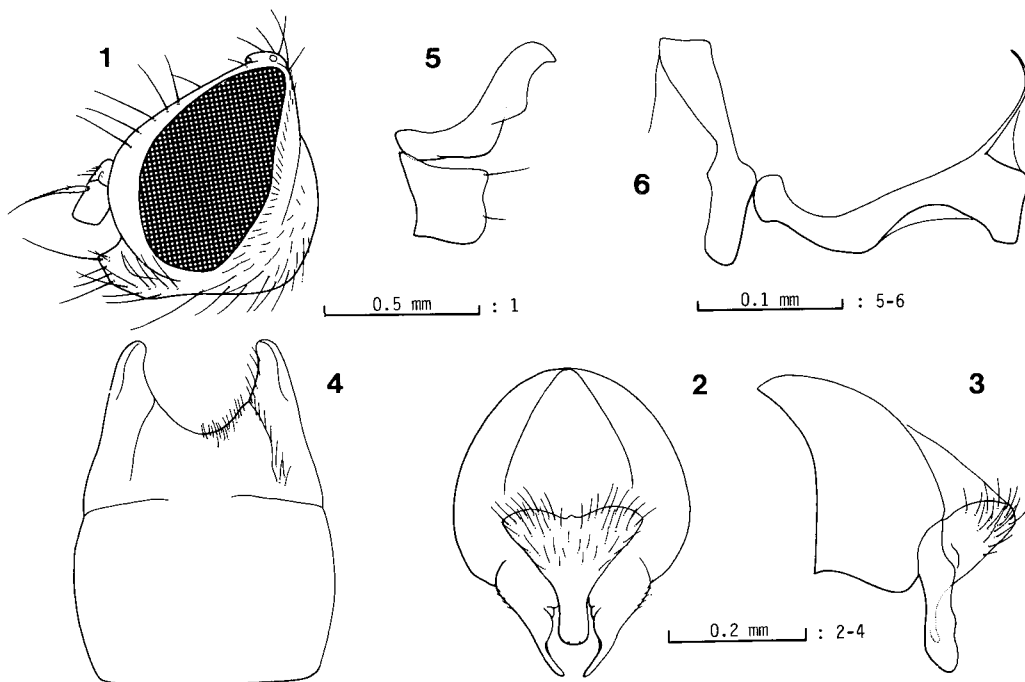


Fig. 13. *Egle korpokkur* Suwa, 1974.

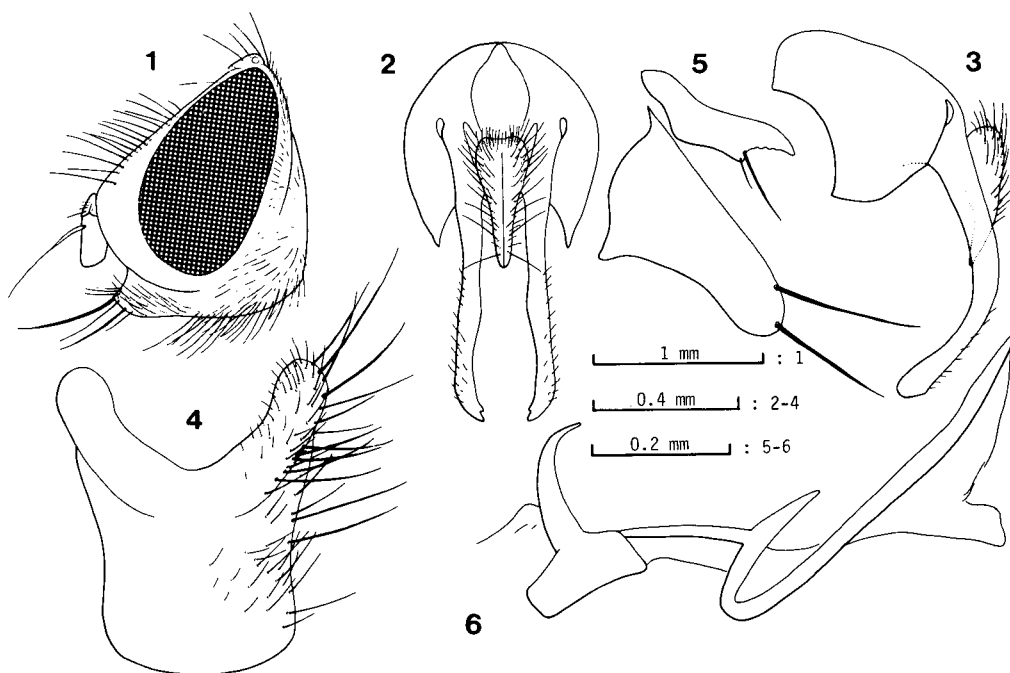


Fig. 14. *Paregle vetula* (Zetterstedt, 1838).

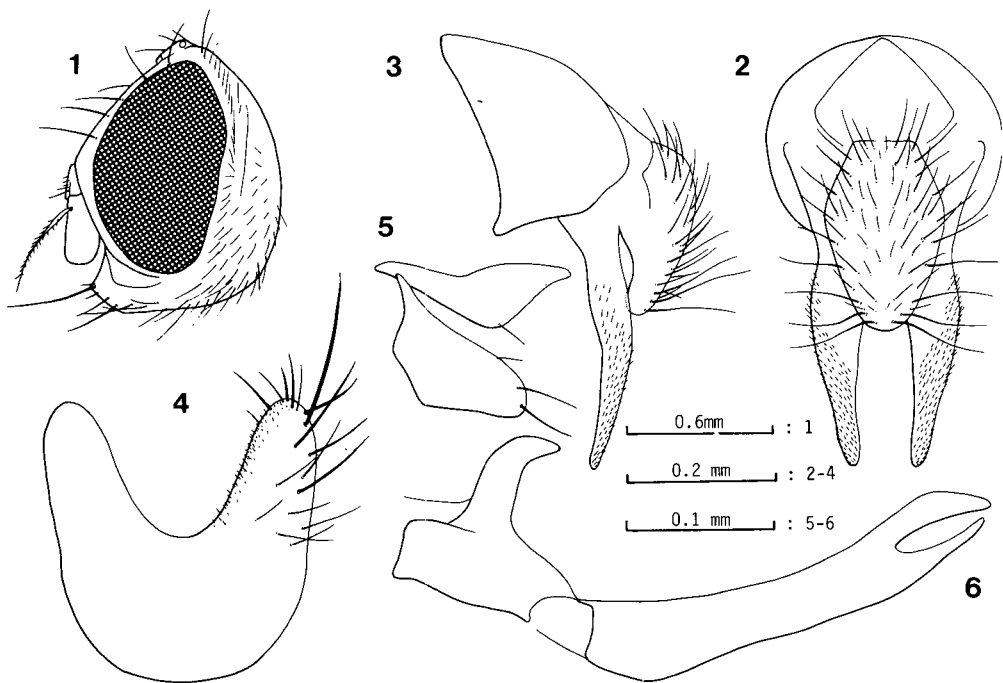


Fig. 15. *Delia expansa* sp. nov.

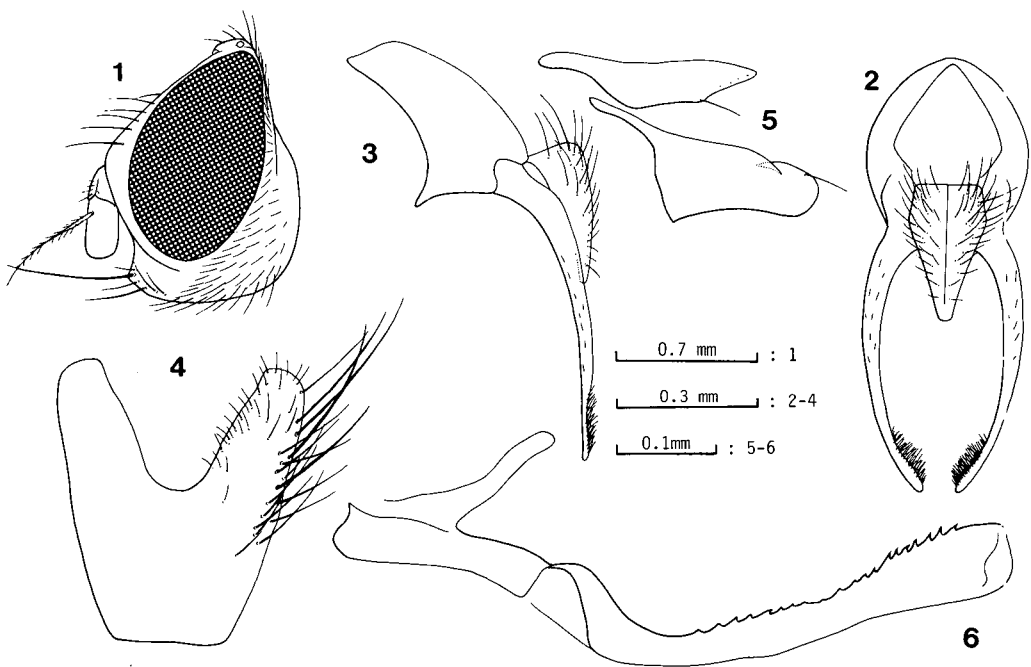


Fig. 16. *Delia tenuiventris* (Zetterstedt, 1860).

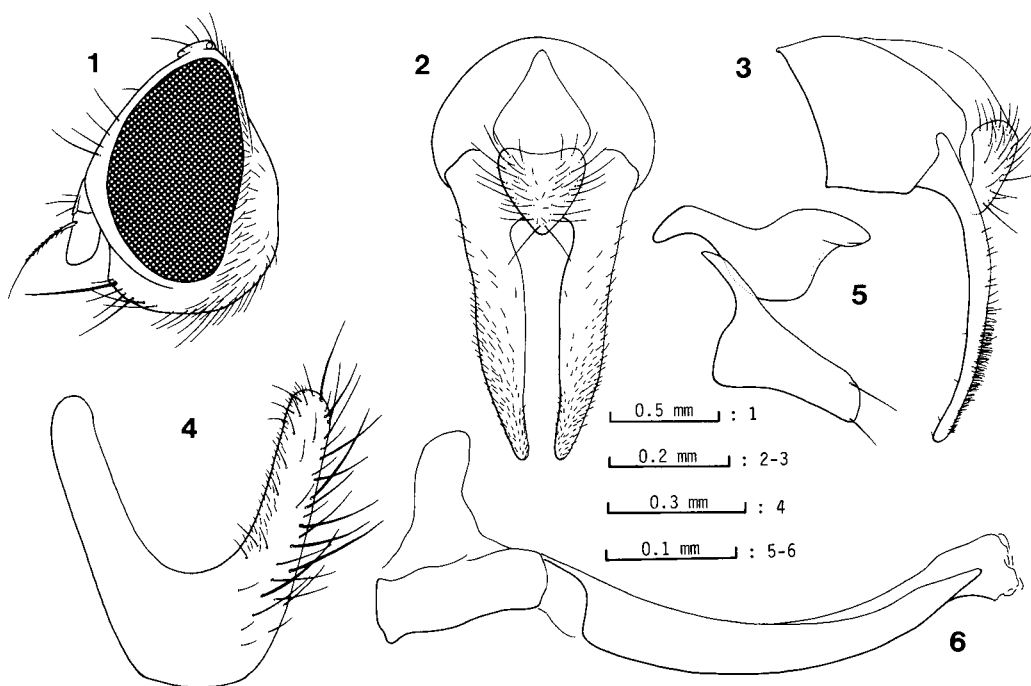


Fig. 17. *Delia cornoariae* (Hendel, 1925).

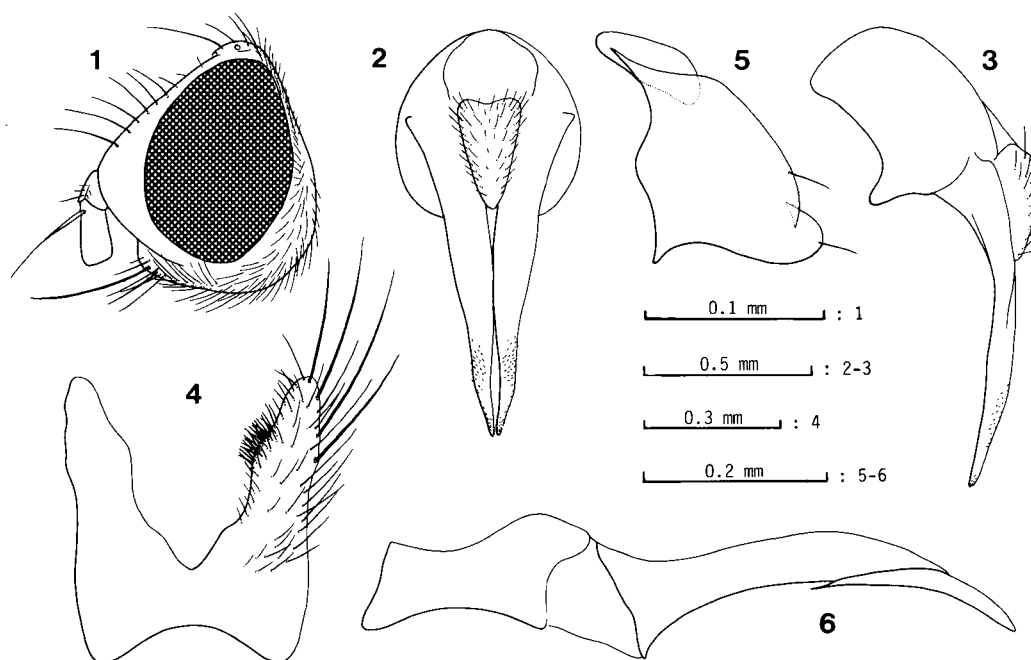


Fig. 18. *Phorbia soyosana* sp. nov.

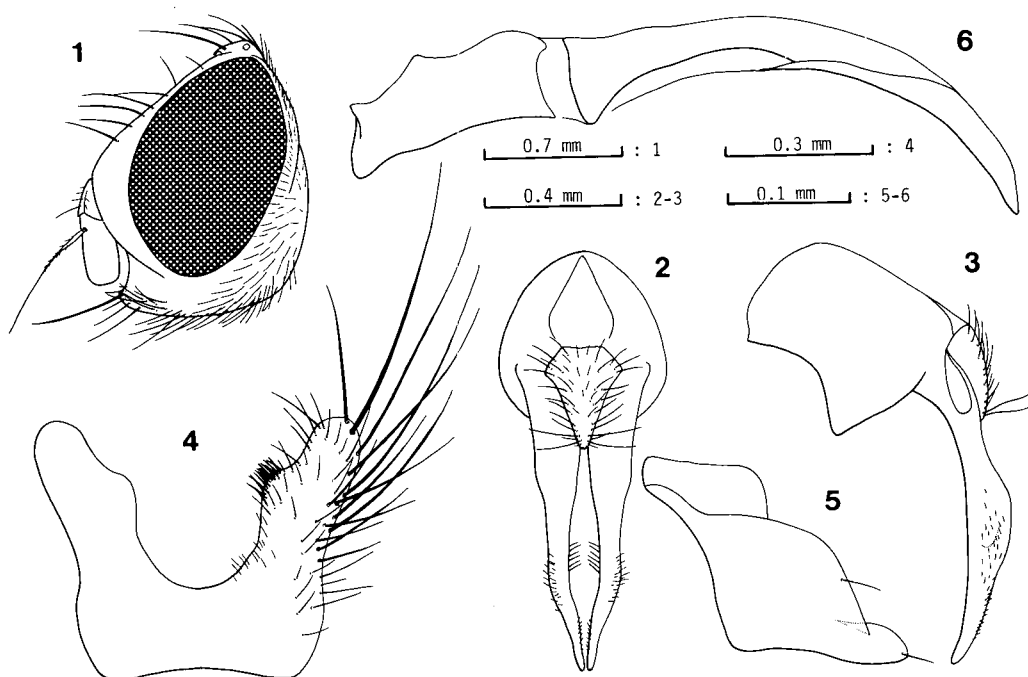


Fig. 19. *Phorbia longipilis* (Pandelle, 1900).

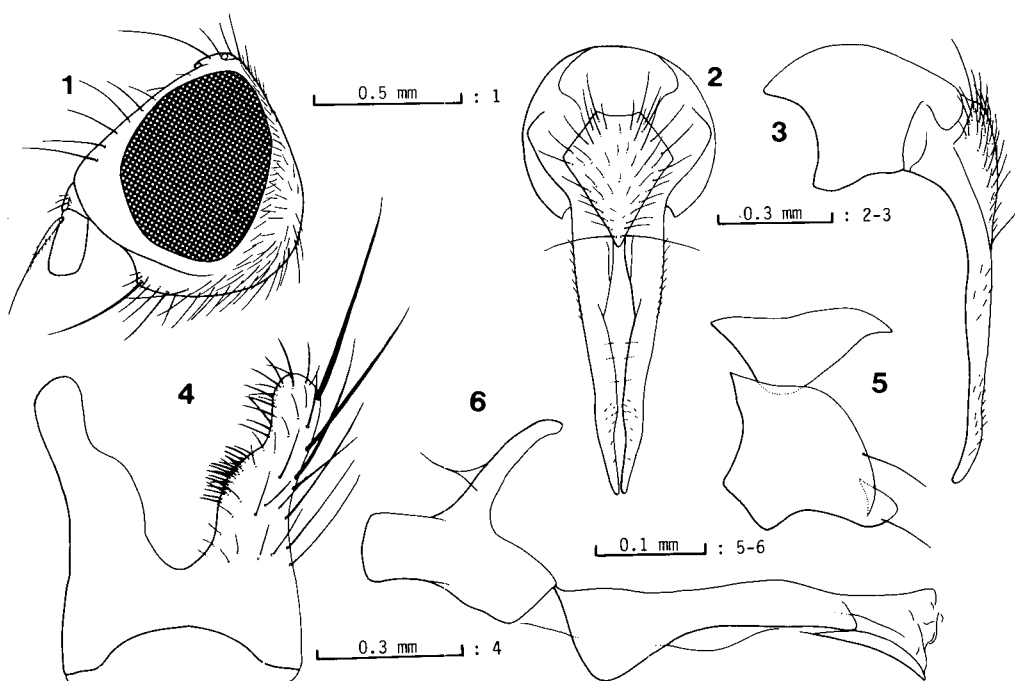


Fig. 20. *Phorbia dissimilis* sp. nov.

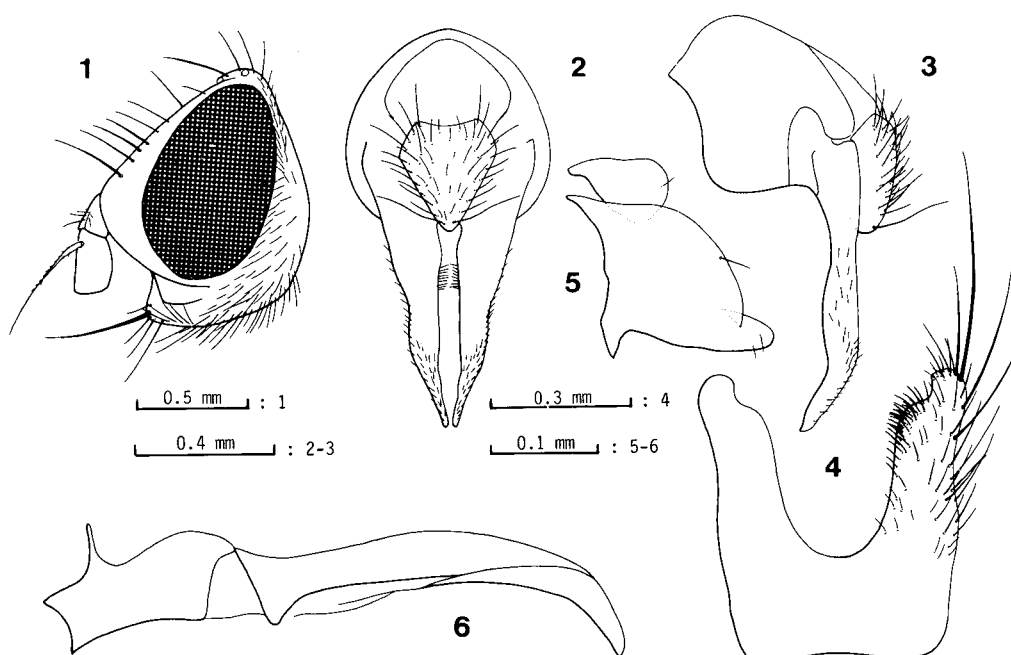


Fig. 21. *Phorbia taeguensis* sp. nov.

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S.J. SUH, Y.J. KWON: Taxonomic Revision of the Family Anthomyiidae from Korea

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